THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The announcement in the past week concerning steel rails, which was as expected, was followed by the booking of orders evidently timed to appear when the price was fixed. The Pennsylvania Railroad, as usual, led off, its order for 202,000 tons being the largest placed at one time. Western roads have placed good orders at Chicago, these amounting to close upon 200,000 tons. These with the Southern and Union Pacific orders for 100,000 tons, of which a large part will be rolled in Colorado, bring the new business already booked for 1904 up to 500,000 tons, while close to 400,000 tons must be carried over. This is a good foundation for next year's business and there is a considerable volume of inquiry in addition. The size of the railroad requirements for next year has had a good effect upon sentiment, and undoubtedly has strengthened the market on the steel side. Simultaneously the outlook in structural material has been improved by the ending of some of the strikes which have been a source of apprehension. The excellent condition of the tin plate industry is well known, and the status of the wrought pipe trade appears in the fact that the leading producer was unable to take on the order for 40 miles of 20-inch pipe for a West Virginia line. In sheets, bars and plates the mills are not so heavily booked as in the lines mentioned, but the outlook is not less promising than in recent weeks. The rail mills, what with the heavy demand upon some of them for billets and sheet bars that promises to be maintained beyond Jan. 1, are now expected to be well employed in 1904. The readjustment in pig iron is one feature of the market that gives uncertainty to the situation. Prices in foundry iron continue to yield, but have not yet reached the point at which any large business is likely to be done. An element of doubt in the calculations of Southern furnaces is the re-adjustment of the coal miners' scale in the Alabama district. The miners have asked for an advance of 7½ cents a ton in both maximum and minimum and the operators have proposed a reduction of 7½ cents in the minimum, or to 37½ cents a ton. It is probable the old scale will be renewed, making the price of mining coal 55 cents a ton as maximum, with iron at $12, and a reduction of 2½ cents a ton in the price of cutting for each decline of $1 in the price of iron, until 45 cents is reached as a minimum. Whatever the settlement, the men are expected to take a week or 10 days of vacation, and for this there has been an accumulation of coal and coke recently. Southern furnaces find somewhat more inquiry, and prices are quite irregular. The association basis of $15 for No. 2 iron is a dead letter and it is intimated that sales on analysis are assisting in the retirement of the grade schedule to the background. Iron has been offered at $13.75 Birmingham for No. 2 and it is reported that on the 20,000 ton inquiry for Western agricultural works some offers have cut this considerably. In the Central West a pipe works inquiry of 3,000 tons of No. 3 and No. 4 has brought out lively competition; but the conditions do not encourage contracting, and buying for one or two months may be followed by most foundries for some time. The data available point to a very heavy melt of iron in foundry cupolas, and it is to be considered that steel companies have furnished the bulk of the recent increase in pig iron production. Northern furnaces have not yet met the extreme low prices of the independent Southern sellers, though Eastern furnaces have made marked reductions in recent weeks and Southern Ohio furnaces are leading in reducing prices in Central territory, as low as $16.50 for No. 2 foundry at Ohio River furnaces having been reported for second half. Bessemer pig iron is sold in moderate quantities, at prices ranging from $18.50 to $19 at Valley furnace according to delivery. The steel market continues very quiet. From $29 to $29.50 at mill is about the range in the Central West, though for early delivery $30 is asked. German iron for the second half is inquired for, and some may be needed. At $28.50 New York for a cargo lot, business could be done, and at a slightly higher figure for Canadian steel.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, June 24.

There is a marked improvement in orders for the minor finished lines and a little better business in the heavier lines such as plates and shapes. Mills do not seem to have any difficulty in running full. In some lines, notably rails, tin plates and merchant pipe, actual tonnage is booked far ahead. In crude steel the movement is small, as a number of mills which are sellers ordinarily, are out of the market. Mills which could spare the steel would not be averse to making concessions on a very desirable order, as it is recognized that for the ordinary finished lines there is no profit in buying crude steel at the quoted rates.

The situation in pig iron is mixed, Bessemer being very firm while foundry is still declining, the buying which has developed not being sufficient to take care of the tonnage of new furnaces and older furnaces whose contracts are expiring. As the advance in foundry grades was overdone, so the pendulum may swing too far in the opposite direction.

Wall Street developments have had a very bad sentimental effect on the iron trade, and the large interests feel that in the circumstances the trade is doing very well in that it is at least holding its own. The labor outlook is a little better. A number of strikes in various parts of the country have been settled which is felt in better specifications and orders for structural material. The local trouble between the bricklayers and stonemasons, regarding what union the latter ought to belong to, has been submitted to arbitration, the men meanwhile going back to work.

The mills have opened their order books for rails for 1904, as predicted last week, and about a quarter of a million tons have been booked, for eastern and central lines, in addition to some 400,000 tons which will be held over. Western lines are understood to have placed good orders at Chicago. The price remains at $28. There was not the slightest expectation that a change either way would be made, and the formal opening of books simply awaited the desire of certain railroads to place orders. There is no expectation that there will be any change in the other heavy lines, plates, shapes and bars, for next year. There is a rumor, evidently unfounded, that sheets and tin plates may be advanced July 1.

Pig Iron.—Sales of between 15,000 and 20,000 tons of Bessemer pig have been made in the past week or ten days, over half being for June or June-July delivery, and the balance running on as far as September. For all the early iron $19, Valley, or $19.85, Pittsburg, was obtained, while the later iron

brought $18.60 to 18.75. In one case only, so far as known, $18.50 at Valley furnace was done. It is very doubtful if this price could be duplicated even under favorable circumstances. The Bessemer pig market is very firm. All consumers are requiring delivery according to contract, and the steel corporation is particularly insistent. In foundry iron conditions remain easy. There is some scattered buying, but the purchases and inquiries noted last week have not made much impression on the market, which is still declining. Foundries are not very busy and the market is also injured by the selling of some new furnaces and the rather uncertain actions of Southern furnaces the past few months. There is no market here for Southern iron, as local foundry can be had, if desired, at lower than the official Birmingham basis and the outside furnaces have not seen fit to name cut prices for this district in the face of no demand. Prices are lower again and some Northern furnaces quote $19.25, Pittsburg, for No. 2 for prompt delivery. Buyers do not seem to have any definite idea what they would be willing to pay on an extended contract, and the only purchases are in cases where the iron must be had. We quote the market as follows for June and July delivery:

Bessemer, Valley	$18 60 to 19 00
Bessemer, Pittsburg	19 45 to 19 85
No. 1 Foundry	19 75 to 20 25
No. 2 Foundry	19 25 to 19 75
Gray Forge, Pittsburg	19 00 to 19 25
Chilled Basic, Valley	18 75 to 19 00
Chilled Basic, Pittsburg	19 60 to 19 85

Steel.—Local sales in the past week probably do not total over 10,000 tons, all for early shipment. We note two lots of open-hearth, aggregating some 6,000 tons, at a price equivalent to $29.75, delivered, Pittsburg. The regular quotation is $30 at mill, while for a moderate tonnage this can be shaded as noted, but only on a very desirable order could $29 or lower be done. Producers are watching the foreign market closely, noting that German steel has been offered at $28 and $28.50 at tidewater, and would make whatever concession might be necessary to prevent any order from going abroad.

Ferro-Manganese.—We quote round lots of imported 80 percent ferro at $50, delivered, and moderate lots at $52.50. Very small lots bring considerably higher figures.

Muck Bar.—The market is very quiet, with mills quoting regularly about $34, which price could be shaded for a desirable order. We note a small lot offered at $33.50, delivered.

Skelp.—The leading steel interest recently took an order from an outside pipe mill for the skelp for 40 miles of 20-inch pipe, the leading tube interest being unable to make the pipe for the delivery required. On ordinary lots of skelp we quote: Iron, grooved, 1.90c; sheared, 1.95c to 2c; steel, grooved, 1.95c; sheared, 2c to 2.05c. On a very desirable order these prices would be shaded.

Pipes and Tubes.—Mills have all they can do to make deliveries desired, and have a heavier tonnage of actual orders on books than at this time last year. The pipe and tube market has been held very steady since the readjustment last fall, and this has produced confidence on the part of buyers. The unusual activity in natural gas lines has also been an important factor. The Manufacturers' Light & Heat order, for a gas line from West Virginia, has been placed with an outside interest, the only one it appears that could make the desired deliveries. It calls for 40 miles of 20-inch pipe. There is no indication whatever of any change in prices, and we continue to quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	63	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
½ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1¼ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1¼ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	62

Bars.—Current business is a little better in steel bars, and mills are kept fairly well employed, while prices are very firmly held. In iron bars the local market is very quiet, and the consumers are all well covered and are not in the market. Mills east and west are quoting 1.70c to 1.75c at mill on various lots, and 1.80c, delivered Pittsburg, has been done in one or two cases, but the total tonnage has been very small for several weeks. We quote the market as follows: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Youngstown, or 1.84¼c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Rails and Track Material.—The rail mills have opened their books for 1904 business at $28, which has been the price since April, 1901. Following the irregular market of 1898 the price advanced rapidly until in November, 1899, the price was fixed at $35. This held until late in the summer of 1900, when the $26 price was put out. After these wide fluctuations a good average was struck at $28, which will remain the price until something serious occurs. Production next year will be much the heaviest on record if there is the demand. The last two years it has been a little over 2,800,000 tons, which will probably be about the figure this year. The Alabama producer now contributes to the tonnage, and Lackawanna, out last year, will become a producer late this year and may contribute its full quota in 1904. About 250,000 tons have been booked in the East for 1904 since the books were opened last week, and about 400,000 tons will have to be carried over. Light rails are not very firm, as production has been heavier the past few weeks. We quote: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $38; 16 and 20 pounds, $36; 25 to 40 pounds, $36. Track materials: Spikes, 2.15c to 2.30c; track bolts, square heads, 2.05c; nexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

Plates.—Specifications are a little better on old contracts, especially on plates for structural work, and new business is also a little heavier. Prices are firmly maintained, as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.66c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary firebox, A. B. M. A. specifications 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Structural Material.—The outlook is more promising this week, as the settlement of a number of strikes in various parts of the country has caused a greater demand for plates. Mills are better satisfied with the new business coming to hand than they are with specifications on season contracts. We quote official prices unchanged as follows: Beams and chan-

nels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—The market is in about the same shape as last week. Official prices are unchanged, but it is possible to do an extra 2½ percent on galvanized, or about 10 cents a hundred. Mills are having trouble getting steel at any price which will let them out whole, as sheet bars are almost unobtainable, and the purchase of billets involves a heavy expense in the conversion into sheet bars. We quote official prices on contracts for 500-bundle lots and over as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

Wire and Nails.—Nail business is unusually good for this time of year, which is ordinarily a very dull season. Prices are very firmly maintained all along the line, and the trade is in very good shape. We continue to quote: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—The market continues quiet, as usual at this time of year. Prices remain as follows: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots. Tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

Spelter.—The market is unchanged from last week, spelter being still very scarce. We quote spot at 5.73½c, Pittsburg, and July shipment at 5.63½c.

Old Material.—There is nothing doing in scrap, as steel works are supplied on old contracts and iron mills are not inclined to do business as nearly all will shut down July 1 for the annual repairs and inventory. We note some low-phosphorus crop ends, etc., offered at $25 and ordinary melting stock at about $20.

Coke.—On contract, it does not seem possible to do lower than $2.75 for strictly Connellsville furnace coke, and $3.25 to $3.50 on 72-hour foundry. The spot market is somewhat irregular, though not as bad as a few weeks ago. Shipments are fairly good, but there is danger of a blockade in the fall. A big stock of coke is being accumulated at McKeesport, presumably against this contingency. Production in the upper and lower Connellsville regions continues at between 303,000 and 304,000 tons a week, as for a couple of months past, and there is strong evidence of a regulation of production to demand.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, June 23.

Chicago has shared generously in the steel rail business for 1904 which has sprung up in the past few days. It is not easy to say how many rails have been sold here within the past week, for to the tonnage additions are being made every day, but the total is now probably in the vicinity of 200,000 tons, in addition to the portion of the 200,000-ton Pennsylvania order that will be allotted to the Western mills and the 100,000 Harriman order. Nearly all the Western systems have either closed for their requirements for next year in lots of 50,000 tons down, or now have negotiations under way. Prospects seem to indicate that the Western rail mills will soon have a big back log securely placed for their 1904 output, assuring activity for next year. President Buffington, of the Illinois Steel Co., says that some of the roads are buying in larger tonnages than last year, and that indications point to a rail tonnage for 1904 in excess of that for 1903. Steel rails have been wearing out rapidly in recent years, on account of the heavier engines and cars. This 1904 business has stimulated to some degree the demand for rails this season also. The inquiry for relaying rails is livelier this week, and if splice bars are sold therewith, there is no difficulty in placing all the rails that the mills can roll at about $31. Foreign rails also have come into greater prominence. A lot of 30,000 tons was recently sold for August delivery at $34, ex ship, Galveston, Tex., and since then a quotation of $32.50 has been made for a similar tonnage, delivered same port.

The market for finished material has a better appearance than a week ago. The difference is not great, but the present trend is toward an improved activity. There is particular activity in plates, the demand for which persistently exceeds the supply. One lot of 5000 tons was purchased for bridge construction, and an inquiry for 25,000 tons had to be declined because shipments could not be made. For finished material generally business is restricted to small tonnages. While the aggregate is a little greater each week, there is not full assurance that the demand in the near future will prove satisfactory to the producing interests.

Pig Iron.—Everybody in the pig iron market agrees that trade is quiet, some thinking the hush is of that kind which precedes a rush. But to date there is not much tangible evidence upon which to base that expectation. The inquiries have not yet appeared. No one knows accurately at just what rate foundry pig iron is being melted in the West. Some interests say that foundrymen are slow to place orders because they have comparatively little demand for castings. There is, however, at least a fair consumption. For the last half of the year 1,000 tons of No. 2 foundry Alabama iron was sold for Milwaukee delivery at $14, Birmingham, or $18.75 delivered, the seller being one of the so-called independent furnacemen. Other makers have been quoting Southern iron rather freely at $14.50 Birmingham. The larger interests that have asked $15 are meeting with a small carload demand, but little business for future shipments is being closed at that figure. There is now in the market one new inquiry for 1,000 tons, third quarter shipments, and several for amounts ranging from 300 to 500 tons. The strategic feature of the market, however, still hovers about the big inquiry from implement sources, concerning the progress of which toward a conclusion little of a definite character can be learned. One report is that 20,000 tons or more may be bought by this large consumer this week. It seems to be purely a question of price. If figures satisfactory to the purchaser are named, the iron will be ordered, but the inquirer is said to be in a position to defer the purchase, if so inclined. The effect of that order upon the general pig iron market, it is commonly expected, would be much like the initial steel rail order last week upon that market, and accordingly the immediate future is uncertain. Little local iron is offered. Quotations of Ohio product do not show much change, and the general aspect of the trade is profound quiet. Quotations are sagging slightly, and as revised are as follows:

Lake Superior charcoal	23 50 to 24 00
Local Coke Foundry No. 1	20 80 to 21 30
Local Coke Foundry No. 2	20 30 to 20 80
Local Coke Foundry No. 3	19 80 to 20 30
Local Scotch Foundry No. 1	20 80 to 21 30
Southern Coke No. 1	19 35 to 19 85
Southern Coke No. 2	18 85 to 19 35
Southern Coke No. 3	18 35 to 18 85
Southern Coke No. 4	17 85 to 18 35
Southern No. 1 soft	19 35 to 19 85
Southern No. 2 soft	18 85 to 19 35
Southern Gray Forge	17 60 to 18 10
Southern Silveries (4% to 5% silicon)	20 60 to 21 10
Southern Silveries (5% to 6% silicon)	20 85 to 21 35
Jackson Co. Silveries (6% to 8% silicon)	25 30 to 26 30
Jackson Co. Silveries (8% to 10% silicon)	26 30 to 27 30
Ohio Strong Softeners	22 00 to 22 50
Alabama and Georgia Car Wheel	26 85 to 27 35
Malleable Bessemer	20 50 to 21 00
Basic iron	20 35 to 20 85

Bars.—There are a few consumers of bars, who bought a year ago for the year expiring July, a slightly heavier tonnage than they have specified. There are now some

negotiations as to whether this unspecified tonnage shall be delivered during the third quarter at the old quotations or whether the contracts shall expire, the purchasers having ordinarily taken minimum tonnages named, but not the maximum. The buyers are not all pursuing the same course, some accepting for the third quarter the undelivered bars up to maximum tonnage; others willing to buy on a new basis. Otherwise there is not great activity in the market. A few contracts for the new season beginning July 1 are being closed, but the aggregate tonnage is not particularly large. There is no change in prices. We quote mills shipments, Chicago delivery, Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.70c to 1.75c. Quotations from store, steel, 2c; iron, 2.10c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

Sheets.—Both from mill and from store there is a good buying of sheets in small quantities and at unchanged quotations. We quote mill shipments, carload lots, Chicago delivery, as follows: No. 27 black, 2.86½ to 2.91½c; No. 28 black, 2.96½c to 3.01½c. Galvanized 75 and 5 percent. On lots from store, we quote No. 27 black, 3c to 3.05c; No. 28 black, 3.10c to 3.15c. Galvanized, 75 percent to 75 and 2½ percent.

Structural Steel.—Inquiry for structural material has improved slightly, though not enough to lift the market from its generally quiet conditions. One purchase for an undetermined quantity, but involving perhaps at least 1,000 tons, was placed during the week, and a goodly number of small lots have been booked. It is sure that about 500 tons will be bought for the Kimbark building on Wabash avenue and there is talk of a new office building on Jackson boulevard opposite Sherman street, requiring probably 2,000 tons. For bridge purposes there is quite an inquiry and more tonnage is going in to that use than any other at present. Jobbers have good stocks and are responding to a fairly good country demand. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, 2¼c per pound.

Plates.—For plates also the demand for bridge work is quite active, in fact so active that the mills with their previous obligations are unable to fill more than a small percentage of the demand from this source. One order for 5,000 tons has been placed this past week but a requirement for 25,000 tons could not be filled. We quote mill prices, Chicago delivery, as follows: Tank steel, ¼ inch and heavier, 1.75c; flange steel, 1.85c. Prices for lots from stock: Tank steel, ¼ inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

Rails and Track Supplies.—In addition to the very heavy tonnage for standard sections, noted previously in this report, there has been within the past week a fair inquiry for rails for this season's shipments. There has been a livening up in all branches of the department. Light rails are moving well and track supplies for early shipments are difficult to obtain. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $39 to $40; regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

Merchant Steel.—Some moderate contracting for merchant steel for the new season has been closed within the past week. The activity has perhaps been the more noticeable for spring steel, several contracts for which in lots of several hundred tons each being closed. Prices are without change. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter steel, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—The mills continue to report an excellent trade, one which can be interpreted only as signifying activity among consumers throughout the West generally. There is backwardness of shipments, and prices are firm. We quote carload lots mill shipments, random lengths f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¾ in. inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	71.85	61.85
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—If there is any difference, tubes are in more backward supply than pipe. Consumers who order two or three weeks ahead of their expected deliveries find unavoidable delays. From the Western railroad shops there is a particularly good demand for special tubes. Our quotations below are on carload lots, mill shipments, f. o. b. Chicago. On less than carload lots, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	43.35	38.35
1¾ to 2½ in.	55.85	35.85
2¾ to 5 in.	60.85	45.85
6 to 13 in.	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—Conditions are practically the same as a week ago. There is a moderate call for pipe and prices are steady. We quote on carload lots, f. o. b. Chicago, 4-inch water pipe, $33; 6-inch, $32; 8-inch and upwards, $31; gas pipe, $1 a ton higher.

Billets and Wire Rods.—Inquiry exists for Bessemer billets but there are no adequate sellers. The trading in this market for the past few days has been principally for open-hearth billets for forging purposes, buyers being more numerous than usual, though purchases have averaged small lots. We quote German basic Bessemer billets, $28.50 to $29, seaboard; domestic Bessemer billets, $32.80; open-hearth billets for rolling mill use, $30.50 to $31; for forging purposes, $34 to $36; wire rods, $39.50 to $40.

Wire and Wire Nails.—Strikes in various portions of the west have interfered somewhat with consumption of nails and the movement to the country has suffered in consequence. But for the season of the year there is no reason to find fault with the current volume of business. The mills are running steadily. Quotations to jobbers, Chicago delivery, are as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized carloads, $2.80; less than carloads, $2.90; Staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; smaller lots, $2.70. Bale ties, 85 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—For spot coke quotations are heard as low as $5. Chicago foundry grade, but for future shipments $6 is about the quotation that is encountered. This is a singular condition, spot selling radically lower than contract coke. There is a fair tonnage on track and current wants are not difficult to fill. High grade Connellsville is quoted nominally at $4 to $4.50, ovens or $6.65, and upward, Chicago.

Old Material.—The market for old material shows some evidences of firmness this week, though on some grades the movement downward continues. Turnings have grown scarce and have taken a slight turn upward, but dealers' forge has gone otherwise and the two grades approximate each other more closely than usual. Fair demand exists for cast scrap and inquiry for melting steel in the East has increased, one

inquiry being for a large tonnage. But generally speaking, the market is very unsettled and quotations uncertain. Dealers' selling prices in gross tons follow:

Old iron rails	$21 00 to 21 50
Old steel rails (mixed lengths)	16 50 to 17 00
Old steel rails (long lengths)	19 50 to 20 00
Relaying rails	29 50 to 30 00
Old wheels	20 00 to 20 50
Heavy melting steel	15 50 to 16 00
Mixed country steel	11 50 to 12 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 50 to 17 00
No. 2 R. R. wrought	14 50 to 15 00
Shafting	16 00 to 16 50
Dealers' forge No. 1	14 00 to 14 50
No. 1 busheling and wrought pipe	12 00 to 12 50
No. 1 cast	13 50 to 14 00
Heavy cast (300 pounds and over)	10 00 to 10 50
Relaying rails	30 00 to 31 00
Country malleable	13 00 to 13 50
Iron axles	21 50 to 22 00
Steel axles	17 00 to 17 50
Cast borings	5 50 to 6 00
Mixed borings, etc	5 50 to 6 00
Wrought turnings	12 00 to 12 50
Machine shop turnings	12 00 to 12 50
Iron axle turnings	12 50 to 13 00
Steel axle turnings	12 00 to 12 50
Stove plate and light cast scrap	9 00 to 9 50
Old iron splice bars	16 00 to 16 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, June 24.

An increasing number of inquiries for foundry iron, continued absence of buyers of ore from the market, fair business in finished material, and dullness with lower prices for scrap, describes conditions of the past week in brief.

Iron Ore.—Some furnacemen have recently expressed a determination to delay buying until prices have been reduced. Sellers, while admitting that the market is practically at a standstill, declare that present prices will be maintained and that anyone who entertains a hope to the contrary will find that it is not well founded. The freight rate from Marquette seems to be established for the present at 72½ cents, with 80 cents from the head of the lakes and 60 cents from Escanaba. Except for delays in unloading coal cargoes at upper lake ports, good dispatch is now being given.

Pig Iron.—More inquiries have been received the past week than for a month or more and some sales of small lots have been made. It is not expected, however, that much business will be transacted in foundry iron until after July 1, when about half the foundries take inventories and close down for a week or two. Agents of Southern association furnaces are making few sales at the announced prices based on $15 for No. 2 foundry, Birmingham, while independent interests are cutting $1 a ton below those prices. Northern iron for the next three months has settled to a basis more nearly in accordance with Southern quotations. While some Valley furnaces quote $19 at furnace, this price is high compared with offerings by others, particularly some quotations by Southern Ohio furnaces, whose iron has been quoted on a basis which with $1.45 freight makes the Cleveland price for the second half less than $18.50. Gray forge is scarce and commands a price nearly equal to No. 2 foundry at present. The following prices are f. o. b. Cleveland, with the exception of that on gray forge:

Bessemer	$19 35 to 19 85
No. 1 Strong Foundry	19 35 to 19 85
No. 2 Strong Foundry	18 60 to 19 10
No. 3 Foundry	18 35 to 18 60
Scotch No. 1	19 35 to 19 85
Scotch No. 2	18 60 to 19 10
Gray Forge, Valley furnace	18 00 to 18 50
Lake Superior charcoal	23 00 to 24 00

Finished Material.—Buyers are reluctant to come into the market, but traveling salesmen report that purchases to meet immediate requirements foot up surprisingly large amounts, showing that manufacturers are still enjoying prosperity. Makers of boilers and tanks are said to be especially busy, having all they can do to keep up with orders. The settling of the strike of the brick makers in Cleveland has permitted building operations to be resumed and the demand for structural material is stronger. Reduced prices recently announced by a leading jobber have been withdrawn. Prices of iron and steel out of store are slightly lower, being 1.85c to 1.90c for steel bars and 1.90c to 1.95c for iron. Bar iron continues dull, local mills selling at 1.70c, Cleveland, while the Youngstown price ranges from 1.70c to 1.80c, the largest producers still adhering to the latter quotation. Steel continues at 1.60c, Pittsburg, for Bessemer and 1.70c for open-hearth. A number of the largest agricultural interests have not yet made contracts. The demand for sheets continues fair, but cutting by the independents is again heard of. The announced prices of the principal producer for sales through jobbers are as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

Old Material.—About the only sales being made, those of dealers to dealers to fill contracts, indicate lower prices and we have reduced quotations on rails, railroad wrought, mill scrap, iron axles, axle turnings, wrought turnings, steel boiler plates, pipes and flues, wrought drillings, stove plate and heavy steel. We quote as follows, f. o. b. Cleveland, gross tons:

Old iron rails	22 00 to 22 50
Old steel rails (over 6 feet)	20 50 to 21 00
Old steel rails (6 feet and under)	19 00 to 20 00
Old car wheels	21 00 to 22 00
No. 1 R. R. wrought scrap	20 00 to 21 00
Mill scrap	16 00 to 17 00
No. 1 machine cast scrap	18 00 to 18 50
Iron axles	25 00 to 26 00
Steel axles	25 00 to 26 00
Axle turnings	15 00 to 16 00
Wrought turnings (free from cast)	14 00 to 15 00
Cast borings	9 00 to 9 50
Uncut wrought iron boilers	11 00 to 12 00
Steel boiler plates	16 00 to 17 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	16 00 to 17 00
Tank iron	16 00 to 17 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	14 00 to 15 00
Malleable iron (railroad)	19 00 to 20 00
Malleable iron (agricultural)	16 00 to 16 50
Stove plate	13 00 to 14 00
Heavy steel	18 00 to 19 00

CINCINNATI.

June 23.

The coke market continues irregular, but there seems to be a somewhat steadier tone prevailing. For 72-hour foundry coke $3.50 f. o. b. ovens appears to be the ruling figure, but quotations of $3 and $3.25 are still heard, although the quality of the lower priced offerings is regarded as questionable. There are fair sales and considerable tonnage is being entered.

Pig Iron.—The market is still in a weak and drifting condition, with buyers holding off and prices being shaded to effect sales. There is decidedly more inquiry and correspondence, with requests for prices on lots ranging from a carload up to 2,000 tons, but buyers show no interest in the market beyond July and August requirements. There is not much business resulting from these inquiries but melters will evidently need iron in the near future. Consumers are calling for iron due them on old contracts, but refuse to negotiate for their future needs. The prices for Southern irons have worked down to practically a $14 basis for No. 2 foundry, f. o. b. Birmingham. The association furnaces are again practically cut out of the market at the schedule and most of their sales are made by analysis, which avoids any reference to the grades upon which the agreed price is based. Northern furnaces are also offering iron at irregular figures and quotations of $17.50 for No. 2 foundry in the Mahoning and Shenango Valley district are heard, and $17 for No. 2 foundry in the Hanging Rock district is an open price, and it has been strongly intimated that $16.50 has been done. It is currently believed in the trade that the Southern association will hold another meeting in the near

future, but the market has worked into such a condition that any attempt to regulate prices by agreement now would be futile. Buyers have seen the market in a declining condition so long, that they are not at all anxious about being able to cover their needs at present prices at least, and with transportation facilities now affording reasonably prompt movement, they are in position to run on lower stocks than would have been safe a year ago. The whole situation at this time seems to offer little encouragement for the buyer to take hold. We quote the market for delivery f. o. b. Cincinnati:

Southern Foundry No. 1	$17 75 to 18 25
Southern Foundry No. 2	17 25 to 17 75
Southern Foundry No. 3	16 75 to 17 25
Southern Foundry No. 4	16 25 to 16 75
Southern Foundry No. 1 soft	17 75 to 18 25
Southern Foundry No. 2 soft	17 25 to 17 75
Gray Forge	16 25 to 16 50
Northern Foundry No. 1	18 65 to 19 15
Northern Foundry No. 2	17 65 to 18 15
Southern car wheel iron	26 25 to 27 25

Finished Material.—The market shows no particular change. Buyers are still taking conservative quantities. Steel bars are steady but iron bars are easy and the steel base is freely quoted on bar iron. Buyers generally are willing to stand the extras on iron and pay this much above the steel price so long as they get the steel base price. It has been hinted, however, that the weakness in iron bars has developed such sharp competion from independent mills, that in this territory 1.70c base can be done on large orders. Iron bars, car lots, are quoted at $1.73 to $1.75 base, half extras. Steel bars remain at 1.73c base, half extras, with the retail price 2c base, half extras, for both out of store. Galvanized sheets are being quoted at 75 and 5 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c to 2.25c for base sizes. The merchant pipe market holds steady and unchanged with a firm tone prevailing. We quote:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12 inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	35.2
1¾ to 2½ inch	54.2	34.2
2¾ to 5 inch	59.7	44.2
6 to 13 inch	54.2	34.2

Old Material.—The market is still in a waiting condition. Buyers are not buying and melters are not in the market. Quotations are largely nominal but are marked down to meet the views of dealers. We quote:

Old No. 1 railroad wrought, net tons	$14 00 to 15 00
Cast machine and foundry, net tons	12 00 to 13 00
Old iron rails, gross tons	17 00 to 18 00
Old steel rails, gross tons	15 00 to 16 00
Old short lengths, gross tons	15 00 to 16 00
Old iron axles, net tons	18 00 to 19 00
Stove plate, net tons	6 00 to 7 00
Wrought turnings, net tons	8 00 to 9 00
Cast borings, net tons	5 00 to 6 00

The Field-Evans Iron Co., of Cincinnati, has sent out an announcement of removal to its new offices, suite 1105, Traction Building, southeast corner of Fifth and Walnut Sts. These offices are equipped with every facility for the proper handling of business, including direct Postal and Western Union wires and local and long distance telephones. The new quarters are handsomely appointed, in a new building, hardly as yet completed, but centrally located and one of the finest office buildings in Cincinnati.

PHILADELPHIA.

June 23.

Prices of pig iron are still working toward a lower level and there is not yet any demand for large lots. Consumers are approaching the time when contracts expire, but it is difficult to predict what prices will prevail on renewals. The hand to mouth buying may continue indefinitely. The price of steel rails has again been fixed at $28 and a considerable tonnage has been booked. It is estimated that the capacity of the rail mills for 1904 in rails and billets will be nearly a million tons greater than in 1903.

Pig Iron.—Sales have been confined to small lots and even for these prices are lower. While quotations have ruled from $19.25 to $19.50 for No. 2 X foundry, $19 could be shaded for a large order. It is expected that next month will show a considerable increase in the stocks of pig iron, but the increase in production is largely in steel-making pig. Imports are small. We quote as follows: No. 1 X foundry $20 to $20.50; No. 2 X foundry, $18.75 to $19.50; No. 2 plain, $17.75 to $18.25; standard gray forge, $17.75 to $18.50; ordinary gray forge, $17.25 to $17.50.

Steel.—There is more activity and small sales are reported at $30 to $30.50 delivered for basic open-hearth. It is not likely that Western mills will be any considerable factor this summer in the Eastern markets.

Finished Material.—The market is extremely quiet. Prices are weak and irregular. We quote: Plates in small lots, 1.90c to 1.95c; carload lots, ¼-inch and thicker, 1.75c to 1.80c; universals, 1.80c; flange, 2c; marine, 2.10c to 2.15c; firebox, 2.20c to 2.25c. Bars, for carloads, 1.75c to 1.80c for refined iron, and 1.70c to 1.75c for steel bars. Beams, angles and channels, ordinary sizes, are 1.73½c to 1.80c for carload lots, with the usual addition for smaller quantities.

Old Material.—Holders are not seeking business and there is almost nothing being done. We quote: Old steel rails, $20.75 to $21.25; miscellaneous heavy steel scrap, $20.25 to $20.50; low phosphorus scrap, $26.50 to $27.50; old steel axles, $22 to $23; old iron axles, nominal, $25 to $27; old iron rails, nominal, $23 to $24; old car wheels, nominal, $22 to $23; choice scrap, railroad No. 1 wrought, $20 to $22; country scrap, $18 to $19; machinery cast, $18 to $19; No. 2 light scrap, forge, $18 to $18.50; No. 2 light scrap, ordinary, $14 to $15; wrought turnings, $15 to $15.50; wrought turnings, choice heavy, $16 to $16.50; cast borings, $10.25 to $10.75; stove plate, $14 to $15.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., June 23.

Pig Iron.—There were no new developments of particular interest in the local pig iron market during the past week. Consumers are still holding aloof from purchasing for extended delivery, and are as strongly convinced as ever that it will be profitable for them to do so. Inquiries for the third and fourth quarters are numerous, but no sales, at least of any magnitude, result. Furnacemen declare that the waiting policy pursued by buyers will, in the long run, affect them the least, as they are all well sold up until September. They also say that their present output is being fully absorbed in making deliveries on old contracts. They assert that many of the latter will soon be executed, and interests affected by them will be forced to enter the market. This is one of the main reasons, they say, why current developments occasion them no alarm. In the meantime buyers are encouraged by the reports of selling at concessions which have reached them from several points, and which, they think, will eventually make the furnaces recede from their present determination to adhere to schedules recently adopted by them. Advices from foundrymen continue to speak of good business, and the concensus of opinion is that, barring serious reverses in the financial world, consumption will keep on a parity with production. The foreign market is in a dull and featureless state, and prices have reached a level where importers find it difficult, if not impossible, to compete with the domestic product. New York prices are as follows: Northern No. 1 X, $20 to $20.50; No. 2 X, $19 to $19.50; No. 2 plain, $18.75 to $19; Southern, No. 1 foundry, $19.50 to $19.75; Southern No. 2

foundry, $18.75 to $19.25; Southern, No. 3 foundry, $18.50 to $18.75; Southern No. 4 foundry, $18 to $18.25.

Rails.—The fixing of prices for 1904 at current quotations at mill, has been followed by the placing of orders aggregating several hundred thousand tons, and by inquiries for a large tonnage. Interests whose course is closely followed have figured prominently in both connections. Some inquiries have been sent abroad, but it is not believed that resulting business will alter the situation here.

Billets—There is no new business being booked in German basic billets, chiefly because satisfactory delivery cannot be obtained. Orders for delivery beginning September or about that time can be placed at $28.

Finished Iron and Steel.—Labor troubles have been responsible for another dull week in the finished material market. Their removal would result in orders aggregating heavy tonnage. In plates the mills seems to be more anxious than usual to take orders, and keen competition is noted where any are possible. Bars are weak, with an attempt being made by interests comprising the Eastern Bar Iron Association to establish a uniform price, something which has not existed in weeks. The demand for sheets is disappointing, with the outlook not promising. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; firebox, 2.30c to 2.50c; refined iron bars, 1.85c to 2c; soft steel bars, 1.75c to 1.85c; steel sheets, in carloads, New York, No. 28, black, 2.90c to 3c; galvanized, 7c and 2½ off.

BIRMINGHAM, ALA.

June 23.

A little better buying movement the past week, while only for small lots for nearby delivery, has encouraged the manufacturers of Southern coke iron to believe that they may soon expect a much better market. A number of buyers have recently come into the market, but their purchases have been confined to lots of 25 to 500 tons—simply to tide the consumers over for a few days or few weeks. There has been but little increase in production the past few months, although it is expected that after the 15th of the coming month there will be an increase of, say, 5,000 tons per month, occasioned by the blowing in of additional furnaces. Where new stacks only replace others the capacity of the new exceeds that of the old by 50 percent. There are still reports that independent furnace interests continue to shade the association schedule of prices just enough to take the pick of the business offering. By this means two or three are reported to have placed their entire output for the third quarter.

Coke and coal both command better prices this week in view of the expected suspension of work at the coal mines for a while after June 30. It is almost certain that the miners will take their accustomed holiday of a week or ten days, whether a new wage scale is agreed upon this week or not.

District No. 20 of the United Mine Workers of America held their annual convention here last week and prepared their scale. Today this scale was submitted to the Coal Operators' Association in joint convention. The demands of principal interest are:

(1) An increase of 7½c per ton in the price for cutting coal—both the maximum and minimum to be increased, making the price, based on the Pratt seam, 62½c per ton maximum and 52½c minimum; such prices to be governed as heretofore by the price of pig iron.

(2) An increase in the day labor wage scale of about 10 percent over that agreed upon last year.

(3) Eight hours to constitute a day's work for any class of labor.

(4) A semi-monthly pay day.

Several other minor matter were included in the proposed scale. The operators submitted a scale asking for a reduction of the minimum from 45c to 37½c, basing their demands on the probability of a further decline in the price of iron. Numerous other rules and regulations were presented by the operators. The indications are now that it will be several days before anything like a satisfactory adjustment will be reached, though it is not generally thought there will be a prolonged suspension of work at the mines. The operators argue that conditions are just the reverse of what they were a year ago, and insist they cannot make any kind of an advance in the cost of producing coal.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., June 23.

Pig Tin.—Bearish interests have been active during the past week, and prices at this writing show a decline of nearly one per cent from our last report. Current business continues light. In London, the metal has been especially weak, and lower values were reached daily. The net declines for the week aggregate nearly £5, due to adverse reports from producing centers on the Continent. The closing prices on the Metal Exchange today were as follows: Spot to June, 28c to 28¼c. London closed today as follows: Spot, £126 10s; futures, £124 15s. Arrivals at Atlantic ports for the month to date amount to 2,420 tons, with 3,185 tons afloat.

Copper.—The feature of the week has been the numerous bad reports which have been promulgated, chief of which was the reduction by the Calumet and Hecla Co. on Saturday of the price of Lake from 15½c to 14½c, and of which the company is the largest producer. Other grades have declined in sympathy, and no difficulty is experienced buying at recessions from the "official" prices. Even at that, large offerings do not attract buyers, who believe that the statistical situation must cause a fall in prices. In London during the week the pressure to sell was very strong, and prices are over £1 lower than those last quoted. Export trade is on the wane. Closing prices on the Metal Exchange today, nominal, were as follows: Lake and electrolytic, 14½c; casting, 14c. London closed today as follows: Spot, £56 7s 6d; futures, £56 2s 6d. Exports for the month to date aggregate 5,686 tons, against 8,929 tons for a corresponding period last year.

Lead.—Is quiet, with lots of 50 tons or more selling at 4.12½c. St. Louis is 4c, and London £11 2s 6d.

Spelter.—Is a little easier; spot being 6.00c nominal. St. Louis is 5.55c for July, and London today sold at £19 15s, the lowest for the year.

Antimony—Cookson's is 7½c; Hallet's is 7c, and other brands are 6⅝c.

Quicksilver.—Still quoted at $47.50 per flask of 76½ pound in lots of 100 flasks. London unchanged at £8 2s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton, and 50c to 60c for smaller quantities.

Some important contracts have been let by the American China Development Co., for rails, bridges, locomotives, cars, machine shop equipment, etc., for the Canton-Hankow Railroad, which that concern is building. Rails have been ordered from Belgian mills. Six hundred tons of bridge material has been ordered and considerable more will be required for the road, which is to be 900 miles long when completed. The American Bridge Co. secured the initial contract. Two locomotives have been ordered from the American Locomotive Co., and the American Car & Foundry Co. has been awarded a contract for 20 third-class passenger cars and a similar number of box cars. The Middletown Car Works, Middletown, Pa., secured the contract for twenty flat cars. The machine shop equipment contracts were awarded principally to Manning, Maxwell & Moore, and the Niles-Bement-Pond Co.

An automobile laboratory for the study of automobile equipment will be established at Case School of Applied Science, Cleveland, this fall. Manufacturers of automobiles will donate the equipment for this laboratory, the only one of its kind in the country.

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THE SHOP MANAGEMENT PROBLEM.

The question of shop management is prominent in the discussions of the American Society of Mechanical Engineers at its Saratoga meeting this week. It is the problem of a maximum of output at a minimum of unit cost, and in one form and another it has been before the managers of metal-working establishments in all the years since the United States came to the front as the chief exponent of intensive production. At one time it is the question of labor-saving machinery as the displacer of hand labor; again it is the problem of increasing the dexterity and mental alertness of the workman, in conjunction with the machine, with the result of larger earnings for the employe and larger product to become the divisor of fixed charges. In the 120-page volume which Mr. Fred W. Taylor presents as a "paper" at the Saratoga meeting, the particular phase of the question treated is "how long it takes to do work," and Mr. Taylor contends that scientific time study is the real foundation of the best management. The whole discussion, as the mechanical engineers have conducted it, has gathered about papers presented in the past few years on the premium plan of paying for labor, the piece rate system, gain sharing, and the bonus system. In the midst of prosperity, when it might be assumed that minute economies of manufacture would be overlooked, some good heads have been at work developing systems for the more accurate adjustment of work and pay, so that the superior workman shall not fail of receiving compensation proportioned to his speed, skill and precision. At the same time the labor unions, with little or no study of shop problems or of the new developments in industry that have had vastly to do with complicating the competitive side of manufacturing, have set about "leveling up" wages. But in this process they have not added one iota toward the establishment of a more stable basis of rewards for shop labor. What they have put up in a wholesale, undiscriminating way will only be coming down again when the temporary props of unusually good business are removed.

The desideratum—and we believe it will be the outcome of all this agitation, ultimately—is a system that will give the employes what they most desire, namely, high wages, and also give the manufacturer what he most wants, a low labor cost per unit of output. The two things are not incompatible, though in the superficial view of the problem they may have appeared to be. But brains and discrimination must enter liberally into the undertaking. The question is not one to be settled by counting noses, as votes on strike propositions are decided. We know that the methods advocated by Mr. Taylor for the operation of shops have been vigorously assailed as being over-studied, and carrying the refinements of analysis of manual operations to an impracticable length. But every such criticism has overlooked an important fact, and that is that the whole system of task subdivision and rate-fixing is based upon an honest effort to give satisfaction to both employer and employe. Mr. Taylor advocates high wages and contends that on high wages and low labor cost as foundations all successful shop management must stand; furthermore, that it is possible to maintain these conditions under the most trying circumstances.

In our next issue liberal extracts from Mr. Taylor's paper will be given, together with the discussion at the Saratoga meeting—both as helping to a solution of what is undeniably the problem of problems in present-day manufacture.

A BRITISH TARIFF AND IRON WORKS BETTERMENT.

The proposal recently before the British House of Commons for preferential tariffs has naturally stirred up great interest among British iron masters. Referring to the vast expenditures for modern equipment at American blast furnaces and steel works, the British comment has usually been that the steel manufacturers of the United States, being guaranteed their own market by a protective tariff, could afford to spend sums that to the British manufacturer were out of the question. Curiously irreconcilable is such a statement with the view generally expressed by British critics of our tariff system, that it imposes such burdens upon domestic manufacturers as seriously handicap them in the pursuit of the world's markets. And there is a home opinion, often vehemently asserted, that agrees that a protective tariff is a hobble upon our manufacturers in the international race for trade. It is interesting, therefore, to read in a British iron trade journal this comment on Mr. Chamberlain's daring proposal:

> The prospect of having this question of preferential tariffs hung up for an indefinite period is not likely to be helpful to the iron trade. Obviously, it would be to the interest of ironmasters if they knew at once whether, under our future economic system, they will be able to possess their home market entirely, "None daring to make them afraid," just as other nations do. There would then be some encouragement to undertake extensions and improvements which, under existing conditions, they are slow to sanction.

The same paper adds this, which is quite significant:

> Probably Mr. Isaac Butler, of the Panteg and Elba Steel Works, voiced the general sentiment of the trade when he declared, at the meeting of the Newport (Mon.) Harbour Commission, that "English firms would not go on spending huge sums of money in bringing their works up to date when they knew the chances were they would have to succumb to the foreigner," and when he added

that if up-to-date works were erected, "it was the working men who would be hit," by the necessity for reducing the numbers employed. We believe that Mr. Butler is one of a number of British steel-making firms which, although possessing all the equipment needed to produce steel, have yet found it cheaper to use imported blooms and billets than to use their own, not necessarily because they cannot produce as cheaply as the Germans, but because the Germans are able, by the aid of their tariff, to sell under cost in British markets.

There is some incongruity in a picture of English steel manufacturers actually "spending huge sums of money bringing their works up to date," and the warning in the same breath that *if* up-to-date works were erected the men displaced by the improvements would be the chief sufferers. But in a general way it is well known that while considerable expenditures have been made, and more are planned, to give certain British works the benefit of American devices and methods, the average steel works board of directors there has been quite loth to make such outlays. The chairman of the British iron trade commission which visited the United States in 1901, himself a manufacturer, has shaken the traditions by declaring openly that British steel manufacturers need the help of a protective tariff to guard their home market against the invasion of American steel when our manufacturers have a surplus seeking an outlet. Some of his contemporaries have been disposed, in the freedom they have enjoyed from American competition in the past three years, to rally him on his faint-heartedness; but meantime the American peril has been replaced by a nearer and very real German peril. How long steel manufacturers like the one quoted above can maintain themselves by importing and working up a half-finished product that a rival nation is turning out more cheaply than they can with their out-dated plant, is a question of serious import. What is to hinder the finished product from coming if that nearer the raw state finds such easy ingress?

We cannot see how there can fail to be added to the present influx of German steel, produced under a protective tariff, a liberal shipment into Great Britain of American steel when the plants of the United States Steel Corporation, commanding all the economies of the millions now being spent in reducing cost to the lowest, shall find it necessary to look away from home for a certain fraction of their business. On semi-finished material the unexcelled natural resources of the United States should make it possible to undersell the British maker; on finished metal products into which labor enters more largely, superior American management and the high efficiency of well-paid labor should give an account of themselves as against the drawback of a long ocean haul.

Undeniably the best safeguard to British industry against the assaults of American competition is the certain and expansive demand upon our manufacturers, that is to come from the best market the sun shines upon—one that has been coveted by British manufacturers for more than a century—the splendid American home market.

Wm. Jessop, of the firm of William Jessop & Son, Sheffield, Eng., who has been visiting United States and Canada, announced at Montreal a few days ago that his company would probably establish a steel plant in Canada. The company's new plant at Washington, Pa., has been running about seven weeks rolling sheets and band saw steel for American customers of the company.

WORKMEN ROBBED OF ALL AMBITION.

President Poulson, of the Hecla Iron Works, Brooklyn, who is a practical iron worker and also an architect, is not antagonistic to unions properly conducted, but he says that under their ill-advised policy, they have robbed many workingmen of ambition to advance. He says:

"It is a serious condition of affairs. It is an absolute fact that we have at our works today ornamental iron work of twenty years ago that we could not turn out today. When the Hecla Iron Works was first established we thought it was impossible to produce work that could compare with the best work of the men in Europe. I sent to Europe and got the best castings made there. My men did not believe that they had the skill to produce anything to compare with them. They did not know their undeveloped abilities. We got a chemist to analyze American iron for the purpose of finding out if the English iron was superior to ours. The chemist told us that the American iron was every bit as good as the English, and if our mechanics were equal to it there was no reason why we could not produce ornamental iron work up to the standard of Europe. Our men, as I have said, did not think that they were as proficient as the European workmen, and they doubted their ability to compete with them. They soon found out their mistake. They not only equaled, but surpassed anything that could be done on the other side. They were ambitious and wanted to accomplish things.

"But the conditions then were different. The men were interested in their work and anxious to do their best. It was not a question of doing just so much and no more. There was no walking delegate who decided what a man should do and what he shouldn't do. The men were just as enthusiastic in striving to do their best as their employers were anxious to get the best results. There was a mutual bond of interest between the employer and the mechanic. The employer could go among his men and work with them and they were glad to have him. They were in harmony. If either side had a grievance they settled it between themselves. An outsider in the person of a walking delegate didn't come in and dictate as to what should be done. I have seen mechanics in our own shops wait around until 8 and 9 o'clock at night to see a piece of work come from the furnace, so interested were they in finding out what had been accomplished. They were bound up in their work. From the man who started a piece of work to the last man who put his hands to it there was a unity of feeling that made each help the other. The aim was to do the most perfect work.

"What was the result? We went ahead of the world. Then came the unions and the advent of the walking delegate. Our employes always had a union among themselves. It was a good thing. If there was any dissatisfaction, we dealt with our men—the men we knew. We never had a strike because of some complaint our men had against us. It was always a sympathetic strike ordered by some walking delegate. The men became stagnant. The harmony between the different trades disappeared. In stead of striving to do the best and most artistic work, it became the question of making the average on a level with that of the poorest workmen. Now a mechanic must not put his hand to anything beyond the limitations laid down by the union. The confidence which existed between the employer and the employe vanished, and in its place there came a feeling of suspicion, one for the other.

"Everybody knows what trades unionism has done for the English mechanic. I don't think it will ever have that effect on the American workman. He is too level-headed and his home influences are too good. In time I have no doubt he will throw off the dominating power of the walking delegate. Some of the walking delegates are all right. They do good for their unions. But many of them are corrupt. It is not a question with them of the men or the unions. It is their own pockets that they are working for, regardless of whom they hurt."

The Union Switch & Signal Co., Pittsburg, has declared the regular dividend of two and one-quarter per cent on the preferred and one and one-half on the common stock. It has been decided to increase the capital stock from $1,500,000 to $2,500,000 by the issue of 10,000 shares of stock at the rate of $70 a share, payable $30 a share July 11, $20 a share August 15 and $20 a share September 15.

U. S. CAST IRON PIPE & FOUNDRY CO. LITIGATION.

Andrew H. McNeal, formerly president of the McNeal Pipe & Foundry Co., of Burlington, N. J., began suit in the Court of Chancery at Trenton, N. J., asking that a receiver be appointed for the United States Cast Iron Pipe & Foundry Co., of which he is a stockholder. The defendant corporation was organized about three years ago with an authorized capital stock of $30,000,000, and absorbed fourteen iron pipe and foundry plants in various parts of the country, among them being the McNeal works at Burlington. McNeal charges that since its incorporation the management of the corporation has been dominated first by the late General Samuel Thomas and subsequently by George B. Hayes, and that the company's affairs have been run more with a view of exploiting its stock in the market than to a practical utilization of its works. It is charged that the principal occupation of General Thomas was that of a promoter of companies and exploiter of stocks, and that Hayes' associates have been financiers and exploiters of stocks. McNeal charges that while the company was not paying the dividends it should have earned under proper management, alluring statements of $1,000,000 surplus were given publicity to influence speculation in the company's stocks. This surplus, he alleges, was largely mythical, and if it existed at all was simply made of money received from the sale of stock. He further charges that a subsidiary plant at Buffalo was operated at a loss of $400,000, and an excessive price was paid for this plant, as well as for four others that were subsequently dismantled and made useless.

Besides asking for the appointment of a receiver to conduct the business, McNeal wants the officers and directors restrained from doing many things that he declares that they have been doing illegally. He also asks that those responsible for purchase of the preferred stock be compelled to make an accounting.

In reply to the charges made by McNeal, Benjamin F. Haughton, secretary and treasurer of the company, declared that the statements were without foundation. He added: "The company has just closed the most prosperous year it has ever had and at the annual meeting next Wednesday the stockholders will be given a full report of operations for the past year. We have every reason to believe it will be satisfactory to stockholders. The financial condition of the company is stronger than it was at the time of its formation four years ago."

A director of the company said the annual report would show net earnings of about $1,200,000, compared with $711,184 reported the previous year, and cash in banks of about $450,000, compared with $179,814 a year ago. This director asserted that the charges made by Mr. McNeal were untrue, so far as he personally knew.

Bolt and Nut Prices Reaffirmed.

At a meeting of the Nut & Bolt Association in New York, June 18, it was decided to make no change in prices. The representatives of the manufacturing concerns were unanimous in declaring for a reaffirmation of the prevailing basis. An official of one company said: "A brisk demand for nuts and bolts exists, and a reduction in prices is not warranted. Our prices are not governed by the movements of pig iron. The labor trouble in the building trades is the only unfavorable feature of the situation. However, all manufacturers are looking for a settlement of these labor differences next month."

The Victor Stamping Co., recently incorporated at Loveland, O., with a capital of $50,000, is erecting a plant 80x260 feet, brick and stone, which will probably be finished by the last of July. The company has twenty acres on the B. & O. and Pennsylvania railroads and Cincinnati & Columbus traction line. McIlvain & Spiegel furnish the boilers and the Stilwell-Bierce & Smith-Vaile Co., Dayton, the heaters and purifiers. The generators and motors were purchased from Jantz & Leish and the engines from I. & E. Greenwald. Wilfong Bros., Philadelphia, are building the galvanizing department. The company will carry on general stamping of sheet metal, will manufacture the Victor coal hod and will deal in tin plate, metals and tinners' supplies. Arthur E. Knecht is president, and Chas. Hulseman, secretary.

THE U. S. SHIPBUILDING CO. CASE.

Arguments were made June 22 and 23 before Judge Kirkpatrick of the U. S. Circuit Court, in the application of Roland R. Conklin and others for the appointment of a receiver for the U. S. Shipbuilding Co. Attorney General McCarter read the answer and also the affidavit of Lewis Nixon, the president, and A. C. Gary, secretary of the company. The answer denies absolutely that there was any insolvency and states the company was able to meet its obligations. It was stated that no arrangement had been made whereby bonds were to be issued on account of the Bethlehem plant; that the plant was not separately acquired; that it was included in the general purchase, and that the promoter was neither Nixon nor Schwab, but John W. Young; that the value paid was a matter of judgment and that good judgment had been exercised in the purchase. It was denied that any excessive prices had been paid, and the company denied that it had made any exaggerated statement as to the company's condition. It was denied also that the company was under the control of Schwab or that there had been any understanding between Nixon and Schwab along the lines indicated in the bill of complaint.

Samuel Untermeyer for the complainant argued that the purchase by Charles M. Schwab of the Bethlehem Steel Co. and the subsequent execution of the $10,000,000 mortgage as a collateral guaranty on his sale and transfer of that property to the defendant corporation was as picturesque a proceeding as any of those made by the directors of the Sixth National Bank who bought and sold the stock of their own corporation. Mr. Untermeyer declared that a year ago the company asserted it had cash assets of $10,000,000, but by a series of brilliant exploits without parallel in the realms of high finance, the treasurer was forced to state that by reason of the use of this money for the purchase of plants and subsidiary corporations, the company was now unable to pay maturing fixed charges, due August 1, of $941,000, and $421,000 additional liabilities due on outstanding notes and accounts. By its own admissions, Mr. Untermeyer declared, the defendant had proved the insolvency charges.

The annual meeting of the Bethlehem Steel Co., which was to have been held June 18, in Philadelphia, was indefinitely postponed. This action was presumably on account of the uncertainty as to the future control of the company.

The Iron Mines of Lapland.

Concerning the reports, which have been widely published, that the valuable iron ore mines in Lapland are to be sold and may fall into possession of American capitalists, a mining expert who has recently visited the mines has written *The Iron Trade Review* as follows in response to an inquiry:

"The Lapland ore properties, located at Kiruna and Gellivare, the controlling interest in which is owned by G. E. Broms, of Stockholm (Sweden), may be said to be, in a sense, on the market. Mr. Broms' interest is quite 90 percent. He is heavily in debt. He has cut quite a wide swath, among other things having sent out an Arctic expedition, and has endeavored to make the properties pay for it all. It may be that his interest has been purchased by this time. He had given an option 60 days or more ago to the Grangesberg Iron Co., operating in the south central part of Sweden, for ten million kroner and a royalty of three öre per ton for all ore shipped for the next fifty years. A kroner is about 26 cents and there are 100 öre to a kroner. When I was in Sweden the Grangesberg Iron Co. was endeavoring to procure a loan from the government of 20 million kroner, for the purpose of paying Broms and taking up floating indebtedness. These ores are largely consumed in Germany, although some cargoes have been shipped to England and Canada. I think the properties may be said to be in the market, unless the Grangesberg Co. option has been closed, and even then I think they could be bought."

The will of Henry Grant Morse, president of the New York Shipbuilding Co., who died suddenly in New York, June 2, has been admitted to probate. The value of the estate is estimated at about $1,000,000. Only $50 is left to each of the testator's five children. All the rest of the estate is left to the widow.

ALLIS-CHALMERS CO.

The second annual meeting of the stockholders of the Allis-Chalmers Co. was held in Jersey City on Thursday, June 18, and Charles Allis, James H. Eckels, Philetus W. Gates, Max Pam and James Stillman, the five directors whose terms expire in 1903, were re-elected. All the officers, committees and superintendents were re-elected, the only change being the addition of James Stillman, of the National City Bank, New York, and Charles Allis to the finance committee. The five re-elected members of this committee are Wm. A. Read, Edward D. Adams, W. J. Chalmers, Mark T. Cox and E. H. Gary. The officers of the company are: E. H. Gary, New York, chairman of the board of directors; Charles Allis, Chicago, president; W. J. Chalmers, Chicago, vice president and treasurer; Henry W. Hoyt, Chicago, second vice president; Philetus W. Gates, Chicago, third vice president; Joseph H. Seaman, New York, fourth vice president and secretary; Joseph O. Watkins, Chicago, assistant secretary. The engineering and manufacturing departments are officered as follows: Consulting engineer, Edwin Reynolds, Milwaukee; chief engineer, Irving H. Reynolds, Milwaukee; assistant chief engineer, Arthur West, Milwaukee; general superintendent, P. W. Gates, Chicago; superintendent of Milwaukee works, Almon Emrie; manager of Milwaukee office, Edgar N. Dickson; superintendent of Fraser & Chalmers works, Arthur Neidermeyer; superintendent of Gates works, Albert J. Gates; superintendent of Scranton works, Geo. C. Forgeot. James A. Milne, Chicago, is comptroller; Henry Woodland, assistant comptroller, and Jones, Caesar & Co., independent auditors.

The additions of real estate, buildings and machinery in the fiscal year ending April 30, 1903, have absorbed $3,069,897 of cash capital, of which $2,747,272.87 was expended for the new plant at West Allis and $322,624 for additions to other plants. For depreciation $278,000 is deducted, making the net additions to manufacturing plant, $2,791,897.50. All the property of the company is owned in fee and is free from mortgages. No mortgage can be placed upon it without the assent of 75 percent of the $16,250,000 of preferred stock outstanding.

The principal departments of the company are now classified and its works specialized for the manufacture of steam, gas, blowing, pumping and hoisting engines, compressors and complete installations of electrical power stations, mining, metal reducing, saw mill, flour mill, crushing, cement, water works and sugar machinery. It is stated in the annual report that the unfilled orders on hand May 1 were sufficient to keep the works in operation the current year, without considering the increased facilities in process of early completion.

Since the settlement of the strike of the International Association of Machinists at Chicago in August last it is stated that the company has been free from any serious difficulty, though it has taken time to recover from the effects of the strike, which at some of the works lasted fourteen months. The new West Allis works are employing 1,200 men and this force will be increased to 2,000 in the next few months. When present plans are completed the new capacity will add five to six million dollars' worth of work annually to the volume of business. Contracts have been let for automatic sprinklers and the most improved fire equipment at the various plants.

The total cash and net cash assets on April 30 were $7,871,342, a gain of $391,324 in net quick assets in the fiscal year. The orders on hand and unfinished on April 30 amounted to $8,797,483, a gain of $640,448 in the year in the amount of work on hand. The balance sheet on April 30, 1903, was as follows:

ASSETS.		
Real estate, buildings, plant machinery, good-will, etc..		$29,199,492 97
Bill and accounts receivable.....	$2,475,578 81	
Stocks of merchandise, materials and work in progress (at cost).....	5,131,800 00	
Cash	1,628,009 45	9,235,388 26
Total.....		$38,434,881 23
LIABILITIES.		
Capital Stock:		
Preferred	$16,250,000 00	
Common	20,000,000 00	
		$36,250,000 00
Accounts payable	$1,079,670 66	
*Dividend No. 8	284,375 00	
		1,364,045 66
Surplus:		
Balance as at April 30, 1902.....	$304,759 51	
Profits for period... $1,653,576 06		
Less: Dividends on Preferred Stock.. 1,137,500 00		
	516,076 06	
		820,835 57
Total.....		$38,434,881 23

The current assets, it will be seen, amount to $9,235,388.26, and the current liabilities to $1,364,045.66, leaving net current assets of $7,871,342.60.

EASTERN PENNSYLVANIA.

HARRISBURG, PA., June 23.—Most of the mills and furnaces are still working on full time, and fuel and material are fairly plentiful, but there are not many orders of size being booked. The largest were those placed by the Pennsylvania Railroad Co., with the United States Steel Corporation and the Cambria and Pennsylvania Steel companies, both of which are controlled by the Pennsylvania itself. The latter companies will roll the rails to be laid in this state. Each will make 42,000 tons.

The Curtins, of Center County, well known in the iron trade, are negotiating for the Spang Furnace at Lenhartsville. It has been idle for years and formerly made charcoal iron. It was built in 1854 and is 33 by 9 in size.

The Lancaster county court has granted an injunction to restrain the molders' union from interfering in any way with the operations of the Marietta Casting Works. This is another step in a long struggle in which the company has kept its plant working. The injunction forbids interference by threats, epithets, violence or ridicule. It also prohibits picketing and boarding of trains to persuade men from working. It is one of the most drastic ever issued in Pennsylvania.

The Pennsylvania Steel Co.'s Bessemer department broke records last week by making 1,600 tons in a day. The entire plant is making the largest output ever known.

The Thomas Iron Co. will shortly make some improvements to its stacks in the Lehigh Valley. All have been making good outputs for the last two months.

The Scott works of the Reading Iron Co. have been held back in deliveries by the Mississippi floods. Five huge cotton presses are held at the works for orders for shipment to plantations which have been flooded. Other orders have been delayed by people who intended to make contracts.

The Carpenter Steel Works has started another furnace and hammer on double turn at its Reading works. The increase in operations is due to orders for projectiles.

The Central Iron & Steel Co. will start to rebuild its burned mill in a short time. All departments except that damaged by fire have been running regularly. The company's open hearth department will probably not start before the end of the year.

The Phœnix Bridge Co. has started work on the great bridge across the St. Lawrence at Quebec. This bridge is remarkable in that it will be a single span 1,800 feet long. It will be built this year, the material being made at Phœnixville.

Another big bridge, being built in the Schuylkill Valley works, is that for the Mississippi at Thebes, Ill., which is under way at Penooyd by the American Bridge Co. It will take 26,000,000 pounds of steel, being designed for railway and wagon traffic.

Wm. B. Scaife & Sons Co., of Pittsburg, sole manufacturers of the We-Fu-Go and Scaife water purifying and softening systems, owing to increased business in this line, have been compelled to add a new shop 60 by 100 feet, at its Oakmont, Pa., plant. It is equipped with the latest machinery, which will be used exclusively for manufacturing the We-Fu-Go and Scaife systems, in addition to the present shops. The company has systems aggregating 95,000 h. p. under construction for steam boiler plants, in addition to systems for dyeing and bleaching in woolen and cotton mills, and for washing in laundries.

The Labor Situation.

WORK OF THE NATIONAL METAL TRADES ASSOCIATION.

The National Metal Trades Association, through its commissioner's office, Cincinnati, has had printed for general distribution the report of the Anthracite Strike Commission. Copies may be had upon application at the nominal price of 10 cents per copy, to defray the cost of printing.

The Employers' Association, of Quincy, Ill., has determined to refuse to negotiate further with striking machinists because the vice president of the Machinists' Union has atempted to intimidate the non-union men, now at work, by making false statements to them regarding the settlement of the strike. The Quincy Employers' Association is working under advice of the National Metal Trades Association.

The National Metal Trades Association has established a National Employment Department. The association has advertised extensively in daily newspapers for skilled workmen in various lines. Upon receipt of an answer to the advertisement the following circular is sent to the applicant:

NATIONAL METAL TRADES ASSOCIATION.
Commissioner's Office, Union Trust Building,
Cincinnati, O.

Dear Sir: In answer to your reply to our advertisement, beg to inform you that this association is composed of several hundred of the largest and best shops in this country. These shops are always looking for competent, reliable workmen, and to that end have established a National Employment Department, in which such workmen are invited to register their applications for positions. The general conditions of employment are stated on the other side of this sheet. If these conditions appeal to you as being fair and just, and if you desire to take a position in shops that have always and will always pledge themselves to maintain those principles, we shall be pleased to have you fill out in detail the application blank hereto attached. You can readily see that it is to the advantage of a workman, who himself believes in these principles, to work in a shop which is likewise pledged to the maintenance of these conditions. On receipt of your application, we will be glad to register the same, and put you in touch with firms having vacancies either in your own city or in some other where you would prefer to work.

One feature of this association's work that may interest you is our certificate of recommendation. It is a well-known fact that many, perhaps most, employes, when strikes are called, do not want to strike. They go out on strike for fear that if they do not, they will be discriminated against by their striking fellow-workmen, and that they will be kept "on the jump" from one end of the country to the other, and never get a job again. Now, this association, to counteract that feeling, pledges itself to take care of employes who have been faithful to their employer during strikes, and to such men, who are competent workmen and of good character, is issued a certificate of recommendation in the shape of a handsome leather-bound booklet. Holders of these certificates are given preference in employment by members of the association. The certificate-holders, of whom there are several hundred, are high-class mechanics, for it is the purpose of the association's members to make this certificate a thing worth having, and the certificate is not issued, except to good mechanics of good character.

The certificate-holders are always looked out for first, and, if they are out of a position, all they have to do is to communicate with the nearest members, or with this office, and a position will be found for them. The certificate of recommendation, therefore, is an asset to a workman, which is worth a great deal of money, and it stands as a recommendation not only to our members, but to all manufacturers, because all manufacturers know that we are very careful as to the sort of men to whom we give certificates.

If any of the above features appeal to you, please fill out the application blank and mail it to this office in the enclosed envelope.

Yours very truly,
E. F. DUBRUL, Commissioner.

The National Metal Trades Association's Position.

1. We recognize that the interests of both employer and employe should be properly protected, and that these interests must at all times rest on the fact that employer and employe are equally interested in the results of the work in which they are engaged.

2. We recognize that any restriction of the enterprise of the employer or the energy of the employes, resulting in depreciation of the quality or quantity of product, is detrimental to the mutual interest of both.

3. We recognize the justice of the recommendation made by the Coal Strike Commission appointed by President Roosevelt, "That no person shall be refused employment, or in any way discriminated against, on account of membership or non-membership in any labor organization; and that there shall be no discrimination against, or interference with, any employe who is not a member of any labor organization by members of such organization."

4. We recognize that there should be no restriction to the opportunities that may be offered to deserving boys to acquire a trade, and that employers and employes should join in their efforts to instruct such apprentices, provided they be employed under written contracts for a specific time of service.

5. We recognize that sympathetic strikes, lockouts and boycotts are relics of barbarism, because they result in no permanent benefit to either side of a contest, and inflict unjust and unfair injury on the public, who depend on our joint efforts for their comfort and welfare.

6. We recognize that as the realization of mutual benefits represented in profits and earnings from our joint labors, depends largely on the employer finding a suitable market for the product, he can best determine the methods of work, the selection of employes, and the character of work to be performed by each.

7. Recognizing these national principles, we agree that should any other cause of difference arise between us and our workmen, which cannot be settled by conference with each other, such matter shall be submitted to a board of arbitration composed of an equal number of such representatives as they may select, whose decision shall be binding on both, and pending said arbitration there shall be no strike or lockout.

Application for Employment.

Dated at 190

To the Employment Department, National Metal Trades Association, Union Trust Building, Cincinnati, O.:

I desire to register my name for employment in shops, members of your association. I have read the statement of your position as printed on the back of this sheet, and I fully concur in the same, and in consideration of your association's pledge to support same, I agree, if employed by your members, to govern myself in their shops in accordance with the principles as laid down. For your information, I submit the following statements, which I warrant to be true and correct in every particular:

Name in full .....Street Address .....
City .....State .....
Age ..... Married ..... Children .....
Nationality ..... Special Occupation .....
Served ..... Years' Apprenticeship with.....
In the City of .....
Approximate wages expected .....
Now working for .....
Can refer to following firms regarding character and ability:

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Prefer to work in following localities:

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Remarks .....
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Commissioner E. F. DuBrul says the replies are coming in rapidly and the success of the undertaking seems assured. The replies indicate that there are hundreds of workingmen who are ready to take this means of freeing themselves from the yoke of unionism.

THE NEW YORK SITUATION.

Ten thousand employes of the George A. Fuller Construction Co. were thrown out of work June 17 by order of the company, thus making the lockout in the building trades in New York complete. Although about 100,000 laboring men in the metropolis are now idle and building operations are paralyzed, the outlook for a settlement of the labor troubles seems to be more favorable. The Inside Architectural Iron Workers' Union has accepted the plan of arbitration submitted by the Board of Governors of the Building Trades Employers' Association and other unions are looking with more favor upon the proposition. Builders are firm in their determination not to resume work until a definite agreement, which will prevent strikes, has been made with the unions.

At the examination of S. H. Parks, the walking delegate charged with extortion of $2,000 from officers of the Hecla Iron Works, President Poulson detailed his meetings with Parks and the ultimate payment of money to have the strike

at the Hecla Iron Works called off. Further hearing of the case was postponed to July 1st.

LABOR NOTES.

The molders, numbering 107, who have been on a strike at Springfield, Mass., have voted to return to work pending a settlement of the differences by arbitration.

The sheet metal workers in the shops of the St. Paul Roofing, Cornice & Ornamental Co., and the Lefebvres-Deslauriers Cornice Co., St. Paul, Minn., are on a strike because non-union men were employed by the companies. Officers of the companies state that the employment of non-union men was necessary, because the local union could not furnish enough of its own men to do the work required.

A citizens' alliance composed of merchants, manufacturers and non-union employes, which has been formed at Shelbyville, Ind., proposes to affiliate with the other non-union organizations in Indiana. The Shelbyville organization differs from the others in an agreement among its members not to employ any union man who strikes in violation of a contract or without due notice to his employer of the existence of the grievance of which he complains.

The brickmakers' strike, which had almost entirely stopped building operations in Cleveland for nine weeks, has been ended by the strikers, who voted to return to work on the same terms which prevailed when they went out.

The wage scale of the Amalgamated Association of Iron and Steel Workers for the ensuing year was signed June 19 by the officials of the Carnegie Steel Co. for the plants formerly operated by the American Steel Hoop Co.

The molders of the Clyde Iron Co., Duluth, Minn., who went on strike two months ago in sympathy with the machinists of the same company, who had demanded shorter hours and more pay, have applied to the management for their old places, conceding that they had lost the strike. The management said it would take back such men as were needed, but places could not be found for all of them. The machinists are still out.

After a strike lasting over nine months, the International Brotherhood of Blacksmiths has succeeded in getting the Union Pacific Railroad to grant its demands, and hire only those who carry its working cards.

About 350 machinists employed in the shops of the Chicago, Lake Shore & Eastern Railroad have gone on strike for an increase in wages.

All the machinists employed in the Crescent Ship Yards, Elizabethport, N. J., are on strike for a minimum wage scale of $3 per day. They have been receiving from $2.50 to $2.75 a day.

The strike at McAlleenan's Boiler Works, Peoria, Ill., has been settled. The strikers insisted that they be paid on Saturday instead of Monday. A compromise was effected whereby they are to be paid every other Saturday night.

The Work of Clairton Furnace.

Clairton Furnace No. 2, of the Clairton Steel Co., Clairton, Pa., blown in June 21, has already made as high as 460 tons in one day, and is expected to pass an average of 500 tons daily within a week or two. No. 1, blown in April 21, has done better than 500 tons for some time and last week averaged between 520 and 530 tons, so that the two furnaces are this week making about 1,000 tons daily. The metal is taken to the open-hearth furnaces in ladles. One of the two 300-ton mixers is completed and the other nearly so. They will be put in use early next month. No. 3 furnace is almost completed, but work is held back on account of the boilermakers' strike. Both No. 2 and No. 3 should have been in blast before this, but No. 2 was only made available by the company taking charge of the work and completing it itself.

Reduction in Pig Iron Freight Rates.

At a meeting of railroad freight agents in Cleveland on June 19, to consider the question of rates on pig iron from the Jackson-Ironton-Hanging Rock District it was decided that present rates are too high as compared with rates made out of Toledo and the following were agreed upon to take effect July 1, 1903. We show the present rates by way of comparison. From Hanging Rock, Jackson, Wellston, Ironton and Columbus, O., and Ashland, Ky., to—

	Effective July 1.	Present Rates.
East St. Louis, Ill.	$2.40	$2.70
Peoria, Ill.	2.40	2.70
Springfield, Ill.	2.40	2.70
Indianapolis, Ind.	1.40	1.85
Richmond, Ind.	1.40	1.85
Union City, Ind.	1.40	1.85
Anderson, Ind.	1.40	1.85
Terre Haute, Ind.	1.80	2.10

The above rates to basing points will be used to make up a new tariff effective July 1.

Roeblings Will Curtail Output.

The John A. Roebling's Sons Co., manufacturers of iron, steel, and copper wire rope and wire, Trenton, N. J., finds that its business in common iron and steel products has fallen off materially, and is considering the advisability of operating the plant only 5 days the week. The company has serious doubts as to whether it pays anyone to work a half day on Saturday, and is strongly inclined to the opinion that it would be better not to work at all on Saturdays. The annual capacity of the plant for iron, steel and copper wire is 65,000 gross tons, and of the rolling mills 45,000 tons of wire rods. The company had prepared plans for 2 large additions to its plant, but these additions will not be erected, at least not at any time in the near future. The company states that wages and prices of material have reached a point where it does not pay to begin the proposed new construction.

F. W. Roebling, in discussing present conditions, said: "The falling off in orders with us is principally in low grade goods and the commoner kinds of iron and steel wire. Our copper wire business is practically up to that of last year, and we judge from our general knowledge of the situation that the demand for electrical apparatus will be about the same as it was last year. The number of operations calling for copper has been much reduced, but those which are projected and under way involve large quantities. There are a great many enterprises of magnitude under way and projected which will continue to call for large amounts of copper, and my judgment is that the total output will come very near being absorbed."

New Jersey Taxes on Steel Companies.

(Special Telegram.)

TRENTON, N. J. Jun 24.—The State Board of Assessors has filed with the State Comptroller the first schedule of corporations subject to the annual tax for 1903. The total of taxes so assessed is $2,375,780. The United States Steel Corporation will pay to the State a tax of $54,679.18 on $1,018,583,600 capital stock; American Bridge Co. will pay $6,866; American Steel Hoop Co., $5,100; American Steel & Wire Co., $8,250; Carnegie Co., $11,750; Crucible Steel Co., $6,250; National Tube Co., $7,750; Pittsburg Coal Co., $6,250; Pressed Steel Car Co., $5,000; United States Cast Iron Pipe & Foundry Co., $4,994.

COLUMBUS, O., June 24.—The Carnegie Steel Co., principal office at Hoboken, N. J., has qualified for business in Ohio. The company has $63,000,000 capital stock, of which $5,450,000 is in property at Columbus, Youngstown and other Ohio cities. The State received a fee of $5,500 for admitting the company to Ohio.

Plans for the erection of a central station heating plant, at Elkhart, Ind., have been drawn. The specifications will embrace 9,400 feet of steam mains and heating accessories. The boiler plant will begin operation with 500 h. p., furnished by two 250-h. p. boilers. The franchise has been secured from the city of Elkhart by C. H. Wright and A. S. Burris. J. H. Mitchell, of Cincinnati, now engineer at the Cincinnati Chamber of Commerce, has been selected as the engineer in charge of the construction and ultimately of the operation of the plant. Franchises have been applied for by the same interests at several other points.

The new shaft at the Chapin mine, Menominee range, which will be known as C Ludington, has reached the ledge at a depth of about 28 feet.

THE LARGEST STEEL CAR.

Special interest attaches to the steel car illustrated below, as it is probably the largest in the world. It was built by the Bethlehem Steel Co. for its own use. The length between centers of king bolts is 64 feet, and the length of the bridge trusses is 66 feet 10 inches. Their height is 6 feet. The car is 103 feet 10½ inches in length over couplers; 10 feet 2¼ inches high, and 9 feet 9 inches wide. It has a capacity of 300,000 pounds, and its actual weight is 196,420 pounds. The car is shown as loaded with two iron castings for the 12,000-ton forging press built by the Bethlehem Steel Co. for the Carnegie Steel Co. Each casting is 21 feet 4 inches long, 2 feet 8 inches wide, and 11 feet 6 inches high, and the total weight of the two is 277,000 pounds. The weight of the car and castings is 473,420 pounds.

For the same forging press referred to above, the Bethlehem Steel Co. has also furnished a number of steel castings. One of these latter required about 325,000 pounds of metal, six 40-ton open-hearth furnaces being brought into requisition for the cast.

Diamond State Steel Co. Meeting.

At the annual meeting at Wilmington, Del., June 19, of the Diamond State Steel Co. stockholders, the management represented considerably more than a majority of the stock. Stockholders re-elected the old directors and approved the president's report. Criticisms were made by C. H. Hoffman and John Boughton, which drew out the fact that the company's gross business in 1902 was $3,301,597; $89,145 was deducted for renewals and repairs, and the gross profit was $204,427 and $50,000 for betterment. Among the questions asked by Mr. Hoffman in his letter to President Wallace were the following:

"To what account were the following items charged: $89,145 for repairs and renewals and $50,000 for betterments in lieu of depreciation? What are the details of the $50,000 expended for betterments? What disposition has been made of the $375,000 cash raised at the time of reorganization, which E. B. Smith stated in a public letter on Dec. 21, 1901, was all paid into the company's treasury, and the great bulk of it was still there on special deposit, it having been set aside as a fund to cover the cost of construction of a new merchant mill? Has this mill been constructed, and if not, what has become of the money set aside for that purpose?"

We are advised that recent reports concerning loss of life and property at the Madison, Ill., plant of the American Car & Foundry Co., including the sensational story of the drowning of 15 employes who were attempting to save property, were gross exaggerations. No employes were drowned. Practically the only damage to the plant will be the loss of the output during the time that the water was up. As the water backed in from below the plant, nothing flowed away and the damage was very small.

A. S. M. E. AT SARATOGA.

(Special Telegram.)

SARATOGA, N. Y., June 24.—Members and guests arrived in good numbers on Tuesday for the meeting of the American Society of Mechanical Engineers, the total reaching 360 for the day, while a considerable accession to the attendance is expected today. President James M. Dodge, in his reply, at the opening session last evening to the cordial address of welcome by Chairman Albert L. Rohrer, of the local committee, intimated that the present convention would take suitable action in regard to the union engineering society house at New York. He alluded to the difficulty of designing an appropriate building to meet the growing requirements of engineers for more than a very few years.

After the preliminary exchange of courtesies, professional papers were presented according to schedule and briefly discussed. They included the following: "United States Army Gun Factory at Watervliet Arsenal," by J. M. B. Scheele; "Test of Hydraulic Elevator Plant," by R. P. Bolton; "Rational Train Resistance Formula," by John B. Blood. An informal reception and smoker followed.

Many excursions to points of interest have been planned and members of the local committee assigned to each trip. The metric question will come up today through the report of the committee, but the subject has been so thoroughly analyzed in the various papers and discussions of previous meetings that there is little apparent inclination to start another debate. The subject has not, however, passed beyond the pale of discussion and may be revived.

LARGE STEEL CAR OF THE BETHLEHEM STEEL CO.

The railway master mechanics' convention opened this morning in the Grand Union Hotel, and the master car builders go in session on Monday. Many supply men are in attendance and there will be a good exhibit of equipment. Few of the exhibits are beyond the preparatory stage, but among the more prominent are those of the Buffalo Forge Co., C. H. Belsher & Co., Armstrong Bros. Tool Co., Carborundum Co., Manning, Maxwell & Moore, American Steel Foundries, American Machinery Co., of Grand Rapids, Rand Drill Co., Westinghouse, Robins Conveying Belt Co., Bethlehem Steel Co., Garry Iron & Steel Co., Philadelphia Pneumatic Tool Co., Jenkins Brothers, Wilmarth & Morman and Federal Mfg Co.

Bruno V. Nordberg has returned to Milwaukee from New York, where he contracted for the construction by the Nordberg Mfg. Co., Milwaukee, of machinery valued at $150,000 to be shipped to J. B. Hagget's Cerro de Pasco mines in Peru. The order includes ten blowing engines, each having a capacity of 24,000 cubic feet of air per minute.

The Industrial Railroad Co., of Lorain, O., capital $10,000, has been incorporated by Wm. A. Donaldson, Talmadge C. Cherry, E. H. Cavett, W. D. Plant and H. T. Plant. It has been reported that the company will build a steam railroad from Cleveland to Lorain, but the incorporators decline to make public their plans.

PERSONAL.

Ernest H. Cady, treasurer of the Hartford Foundry Corporation, Hartford, Conn., has retired from the company as an officer, though he still remains on the board of directors. Theodore M. Lincoln, president of the company, has been made treasurer also, to succeed Mr. Cady.

William H. Crehan, superintendent of the tube department of the Youngstown Iron Sheet and Tube Co., has resigned his position. He will be succeeded by Henry Doyle, formerly of Spang, Chalfant & Co., of Pittsburg.

W. G. Hildebran, of the Wellman-Seaver-Morgan Co., Cleveland, goes to Akron, O., to take a similar position, that of assistant works manager, with the Webster, Camp & Lane division of the company. He is succeeded in Cleveland by Geo. W. Burrell, heretofore assistant secretary.

F. W. Möller, of the engineering staff of the Webster, Camp & Lane plant at Akron, O., is in Europe on business for the company.

Hugh B. Wick, of Youngstown, O., for a time purchasing agent of the National Steel Co., has become identified with the management of the Elyria Iron & Steel Co., Elyria, O. His father, Henry Wick, has a considerable interest in this company.

Geo. L. Reis, for a number of years superintendent of the Bay View works of the Illinois Steel Co., and for a few weeks past general superintendent of the South works of the company, has resigned to become first vice president of the Lackawanna Steel Co.

S. T. Johnston, of the foundry equipment department of S. Obermayer & Co., Chicago, sails for Europe next week.

Geo. H. Griffiths, Chicago manager of *The Iron Trade Review*, sails for England on June 27, in the interest of this paper and its constituency.

President Maben, of the Sloss-Sheffield Steel & Iron Co., has returned from his trip abroad.

W. A. Field has been appointed general superintendent of the South works of the Illinois Steel Co. to succeed Geo. L. Reis, recently resigned.

Daniel G. Reid, president of the American Tin Plate Co., has offered Richmond, Ind., his birthplace, $50,000 for a hospital on condition of a $25,000 appropriation by the city for endowment.

John T. Horner, superintendent of the Sharon Tin Plate Co.'s plant at South Sharon, Pa., has resigned and will remove to Pueblo, Col.

William Burlingham has accepted an appointment as chief engine designer with the B. F. Sturtevant Co., of Hyde Park, Mass., resigning a position in the United States inspection office with the Wm. R. Trigg Co., of Richmond, Va. Mr. Burlingham has previously been associated with the Bath Iron Works, the General Electric Co., the Southwark Machine & Foundry Co., and the Newport News Ship Building & Dry Dock Co. He has also served on Thos. A. Edison's staff at the East Orange Laboratory and is a graduate of the Worcester Polytechnic Institute.

J. M. Longyear, well known as an important holder of Lake Superior iron ore and timber lands, is referred to in the following Boston dispatch. This removal of a splendid residence recalls the similar action of John Stevenson, Jr., in removing his famous New Castle, Pa., mansion to Sharon, Pa.: "Piece by piece the half-million-dollar mansion of John M. Longyear has begun to come to Brookline from Marquette, Mich. It will take several months for the entire structure, mostly of stone, to be transported east, and then it will be built again on a magnificent site which Mr. Longyear bought last December in the fashionable Boston suburb. The entire work of transporting and rebuilding the mansion will occupy two years."

L. C. Gage, of the Chicago office of Jones & Laughlin Steel Co., has resigned, to become manager of A. Bolter's Sons, Chicago, founders and manufacturers of structural iron, the resignation to take effect July 1. Mr. Gage has been with the Jones & Laughlin Steel Co. for eighteen years, the last several years in charge of structural sales.

Wm. B. Schiller, president of the National Tube Co., has been made a member of the board of directors of the Lorain Steel Co., and also chairman of the board. This is an active position, and the connection is understood to be by reason of the tube company having started erecting its large tube plant at Lorain, which will be supplied with steel mainly from the Lorain steel works.

LAKE SUPERIOR IRON MINES.

The contractors who built the No. 3 ore dock for the Great Northern R. R. at West Superior, Wis., turned it over to that company June 15. The present docks have been overcrowded. In May, they shipped 651,000 tons or ore, the total amount to the 1st of June being 102,000 tons ahead of the same period last year. Last year the Great Northern shipped about 4,200,000 tons in all, and at the present rate the two docks alone would reach nearly five millions. With the new dock going into commission June 15 the mark for the year should be over six million tons, or considerably better than Duluth or Two Harbors will be able to do. The new ore dock is just half the length of dock No. 2, which now ships over two-thirds of all the Great Northern ore, it being the largest ore dock on the lakes. The intention of the company is to build the new dock to the same length as the big dock another season.

John W. Gates, of Chicago, who has for nearly a year been exploring on the amygdaloid outcroppings on the westerly portion of the Keewenaw formation, at the west end of Lake Superior, has stopped work and abandoned the properties. The fee owners now state they will take it up and continue. Mr. Gates has spent nearly $25,000 and has done very thorough and careful work, exposing copper in many places, but not in sufficient quantities, it would appear. The formation is supposed to be more bunchy than that nearer Houghton.

Two companies are now organized, and working, in what are claimed to be coal areas of northern Minnesota. These areas lie west of the Mississippi river and almost due west of the Mesabi range, and both these companies are holding lands in northern Aitken county. Each of these companies has several thousand acres of land in fee and under lease, and the Quodenaw is sinking drill holes and a shaft, while the Willow River Co. is sinking with drills only. The former company claims to expect to have a shaft in its coal this fall. Both state that their coal is a fairly good grade of bituminous, carrying very little sulphur.

The Stephens mine, on the line of the Duluth & Iron Range road, and belonging by lease to the Oliver Iron Mining Co., has commenced shipping, with one shovel in ore, after two years of preparation. The mine is one of the very large properties of the Mesabi range, and is sure to make as large a record for shipment as its operators desire. The ore is of good quality, especially so physically, and the lease is at 15 cents a ton, with an annual minimum of 100,000 tons. The mine is an open pit proposition, and an immense amount of stripping has been done, the surface improvements are most elaborate and complete, and the arrangement for the comfort and convenience of the employes is, as at all Steel Corporation mines, most adequate and excellent. This is the most easterly large property on the Mesabi range and is but 51 miles from the lake.

The Republic Iron & Steel Co. has commenced the shipment of its 50,000-ton "Victoria" stockpile, which has been on surface for four or five years. All other shafts of this company are shipping steadily and rapidly, and its product for the Mesabi this year will be the largest to this time. It is now operating the Republic group, including the Republic, Bessemer, Victoria and half the Union, the Pettit, and the Kinney, which latter is an open pit property.

The Lake Superior Iron Co. celebrated its fiftieth anniversary June 24. James H. Hoyt, of Cleveland, who was expected to deliver the principal address of the celebration, was unexpectedly called to New York and was compelled to send his regrets. James Gayley, first vice president of the U. S. Steel Corporation, and others delivered appropriate addresses in the morning. At the conclusion of the speaking program, a barbecue was held, after which Cornish wrestling, log burling and other contests were engaged in. In the evening a ball was held in a tent placed in the rear of the company's new office building.

The Stephens Mine, the farthest east of any proven and de-

veloped Mesabi ore body, entered the shipping list a few days ago, and is now forwarding several hundred tons daily to Two Harbors.

Extensive improvements are being made at the Republic Mine, Marquette range, one of the most important of which is the installing of two powerful compressors, with a capacity more than double that of the four Rand compressors now in use. Another improvement made is the putting in of a double skip in the Pascoe shaft which was abandoned ten years ago. Up to the present time this season's shipments of ore from the Republic Mine have been light, being only about 15,000 tons per month, but it is expected that in July a steam shovel will be installed and the rate of shipment increased to about 45,000 tons per month until the ore in stock has been shipped. The shovel will be started at the No. 9 stockpile.

The iron ore proven up in the Baraboo, Wis., district is now thought to be about 12,000,000 tons. The Wisconsin Iron Mining Co. claims to have developed 7,000,000 tons and the Iroquois Iron Co., of Chicago, has done extensive prospecting with an estimated result of 3,000,000 tons of high grade ore. Scores of individuals are prospecting and drilling in the vicinity of Baraboo and North Freedom. The Illinois Iron Co. has 5,000 tons in its stock pile at North Freedom, taken out in development work. The ore is said to be high grade, most of it being Bessemer ore.

The Caspian mine, property of the Verona Mining Co. is said to be showing up well. The work at the present time is confined to cross-cutting and drifting the ore body at the 300 feet level.

The improvement of the plant of the Hiawatha mine, Menominee range, is progressing rapidly. The foundations for the new boilers have been completed, and one of the boilers is already in place. Underground, the mine is being prepared for hoisting ore more rapidly than has been done in the past.

Shipments from the Clergue syndicate's Helen mine this year are said to be of a higher average percentage than before. The company's furnaces at the Sault are about ready for work, and three of the four Mesta blowing engines are connected up. Some 200 men are employed around the furnaces finishing them up. The company's charcoal plants and by-product refineries are exceeding expectations, the retorts making 25 percent more coal than was figured on and and the by-product plants giving returns 20 percent better in acetic acid and alcohol than was claimed. The coal made is of exceedingly strong structure and capable of holding a heavy burden. With an accumulation of metal from the furnaces the rail mill will resume on Canadian orders. Woodworking plants, pulp mills and chemical works of the company, including sulphur and nickel works, are in operation, and a nickel refinery, the final works of the chain planned and carried almost to completion by F. H. Clergue, is going up as fast as may be. There seems to be no great change in plans from those heretofore outlined, and the management is apparently working along, though more slowly, the lines laid out by Mr. Clergue.

About 1,000,000 tons of ore have been shown up by drill explorations in what is called the Tesora mine, of the Fay company, in the se of the sw of 13-57-22. It will probably not be opened this year, though a stripping property. The Forest, of the same company, is further west, and it cannot be made a shipper this year.

There is a partial cessation of work at the new Higgins of the Minnesota Iron Co. in 5-58-17, where drills showed up a very nice body of ore last year. It was proposed that the Higgins and Hedderly should be worked together but unexpected obstacles arose.

The Republic Iron & Steel Co. is said to be in negotiation for an ore body lying joining its Kinney mine, which is under lease to Messrs. Roberts and Wallace, in section 14-58-19.

Some finds are being made in 56-24, especially in section 28, and near by Fletcher Bros., of Minneapolis, have made a find there that may be of importance.

Most of the outside explorers who have been working on the Mesabi range the past few months, are ceasing operations. As a general thing they have found very little ore in quantities sufficient to be merchantable. The Gates Iron Co., which is exploring in 13-58-20, is said to have found about 80 feet of ore in one hole, and has a very good prospect of making a mine. Superior, Wis., men will work on the town site of Chisholm, the mineral rights to which they have bought. J. B. Middlecoff and C. F. Leland, of Duluth, are working in 14-58-20.

A diamond drill is to be put on the leases of the Delta Iron Co., which has been working in 21-59-14 for the past six months, and which now thinks it is on the edge of a good find. The lands of the Oneota Iron Co., in the same town, are to be explored this summer.

G. A. St. Clair, of Duluth, who has been working in the old Felch Mountain region all winter, and who is now shipping from the Northwestern mine, is opening two other properties there, and expects to make an important development in that region the coming year. Mr. St. Clair's steam shovel, which has been at the Sparta mine, Mesabi range, has been shipped by him to the Gogebic.

Biwabik mine shipments for the year promise to be over a million tons, which will be 350,000 tons more than last year, and greater than in the mine's history. All last winter shovels were kept in the stripping in order to complete the new through cut and to open the ore body wider at the north side. This mine will hereafter ship to Two Harbors docks, in place of to Duluth. The shift is made to the D. & I. R. road simply because the haul is shorter over that road than over the Missabe. The same is true of the Duluth mine, a part of the Biwabik ore body, and that mine will send its ore to Two Harbors hereafter. The Duluth, Missabe & Northern road will have its hands full caring for the Hibbing district, Mountain Iron and 58-20, where it has an enormous tonnage to move yearly hereafter.

Lake Superior mining men interested in the new and wonderful copper properties in the Warren district of Arizona, were more than pleased last week to receive word that at the Calumet and Pittsburg development copper had been cut in the 910 foot level running 45 percent and of no small width. This development is owned almost entirely by iron mining men at Duluth and Pittsburg and by copper men at Calumet and Houghton. It is now believed that it will be one of the very large mines.

Contracts have been given at the Mary Charlotte mine, Negaunee, for stripping an acre of surface about 18 feet deep and work has commenced with a number of teams. The ore will be mined by the milling process.

New Sheet Mills at McKeesport.

(Special Telegram.)

PITTSBURG, June 24.—The American Sheet Steel Co. started yesterday upon the demolition of the old frame buildings at the W. DeWees Wood plant at McKeesport. The frame building will be replaced by one of steel and corrugated iron. The 17 sheet mills will be rebuilt and will be raised so as to be out of reach of floods from the river. Only two mills will be off at a time. Two modern sheet mills will be added.

President Schwab's Reported Resignation.

(Special Telegram.)

PITTSBURG, June 24.—In response to inquiries from this city President Schwab sets at rest the telegraphic report of yesterday that his resignation would be announced to-day, or before the week's end. He says that he has not resigned and does not intend to to-day or this week.

After July 1 the Pittsburg Filter Mfg. Co., of Pittsburg, will occupy its new offices on the 21st floor of the Farmers' Bank Building. This change is made necessary on account of the additional volume of work the company has under construction.

The Toronto & Niagara Power Co. has called for bids on what will be the largest power wheel pit in the world. It will be 480 feet long, 180 feet deep and 27 feet wide, cut through the solid rock. The work will cost $1,250,000 and will develop 225,000 horsepower.

The Oliver Iron Mining Co. is doing some exploratory work on Section Six, adjoining the new Aragon shaft, with a diamond drill.

The Bursting of Emery Wheels.*

BY CHARLES H. BENJAMIN.

Several years ago the writer was consulted regarding some points of a case in litigation occasioned by the bursting of an emery wheel and the resulting death of a workman. The question to be decided was whether the wheel was unsafe at the speed recommended by the makers, or whether the accident was due to the carelessness of the operator. As it was just then an off year for experiments on fly-wheels there seemed to be no good reason why the same medicine could not be tried on emery wheels. The apparatus already described in former papers read before this society, with some slight alterations, was adapted to the new requirements, and in the spring of 1902, fifteen wheels of various makes were tested to destruction.

FIG. 1.

For the actual details of the work credit is due to Messrs. Chandler and Krueger, of the class of 1902, Case School of Applied Science. Most manufacturers of this class of wheels test them for their own information, but the results are not generally given to the public. The writer knows of no published data on this subject. At the Norton Emery Wheel Works, all wheels are tested before leaving the shop at a speed double that allowed in regular service, and occasionally wheels are burst to determine the actual factor of safety.

FIG. 2.

Emery wheel accidents are not uncommon, but can usually be traced to the carelessness of the operator. One common cause of failure is allowing a small piece of work to slip or roll between the wheel and the rest. The writer was once present at an occasion of this kind, and although he fortunately was not in the plane of rotation, he has never forgotten his sensations.

The wheels selected for the experiments were all of the same size, being sixteen inches in diameter by one inch thick, and having a hole one and one-quarter inches in diameter. The object of the experiments being to determine the bursting speed of such wheels as are actually on the market, emery wheels were obtained through various outside parties without indicating to the agents or manufacturers the use to be made of them. In this way wheels of six different makes were obtained, the label on each wheel showing usually the maker's name, the grade number or letter, the quality of emery and the speed recommended for use. As shown in the table of results, the working speed varied in the different wheels from 1,150 to 1,400 revolutions per minute, the average being about 1,200 revolutions per minute. For a diameter of sixteen inches this corresponds to a peripheral velocity of about 5,000 feet per minute. The table also shows that the fineness of the emery varied from ten to sixty, the average being about thirty.

FIG. 3.

FIG. 4.

The wheels were held between two collars, each six and one-eighth inches in diameter and concaved, so as to bear only on a ring three-fourths of an inch wide at the outer circumference. The method of testing, and the apparatus used were precisely similar to those described in the paper on "The Bursting of Small Cast-iron Flywheels" in Vol. xxiii. of the

*Read at the Saratoga meeting (June, 1903) of the American Society of Mechanical Engineers.

FIG. 5.

FIG. 7.

Transactions of this society, to which reference is here made for illustrations of the apparatus.

The table shows the results of the experiments in detail, and needs but little explanation. The illustrations show the characteristic fractures, and the appearance of various wheels after bursting.

TABLE I.

No. of Test	Grade Mark	No. of Emery	Working Speed		Bursting Speed		Speed Ratio	Factor of Safety	Remarks
			Revs. per Minute	Feet per Minute	Revs. per Minute	Feet per Minute			
1	4.5	20	1,200	5,030	3,100	13,600	2.58	6.67	
2	4.5	20	1,200	5,030	3,200	13,400	2.67	7.14	
3	4.5	20	1,200	5,030	3,350	14,020	2.79	7.73	
4	Q	30	1,250	5,230	3,750	15,700	3.00	9.00	
5	Q	30	1,250	5,230	2,750	11,500	2.20	4.84	
6	H	30	1,400	5,870	4,550	19,056	3.25	10.56	Wire Netting
7	H	30	1,400	5,870	4,600	19,200	3.28	10.76	
8	O	36	1,250	5,230	4,100	17,200	3.28	10.76	
9	O	36	1,250	5,230	4,125	17,250	3.30	10.89	
10	2.5	60	1,150	4,830	2,750	11,500	2.39	5.71	
11	2.5	60	1,150	4,830	2,900	12,100	2.52	6.35	
12	M. H.	14	1,200	5,030	3,100	12,970	2.58	6.66	
13		24	1,200	5,030	3,800	15,900	3.17	10.00	
14	H	10-12	1,200	5,030	4,100	17,200	3.42	11.70	Vulcanized Rubber
15	H	10-12	1,200	5,030	4,350	18,200	3.62	13.10	

Wheels numbered 1, 2, and 3 were of one make, and show a remarkable uniformity in strength. Nos. 4, 5, 8, and 9 were all made by one firm; the two latter wheels were of finer grain than the others, and show a correspondingly greater strength.

Nos. 6 and 7 contained a layer of brass wire netting imbedded in the emery, and were about one-third stronger than the average of the ordinary wheels.

The wheels numbered 10 and 11 were the weakest among those tested, but have an apparent factor of safety of between five and six.

Nos. 12 and 13 of still another make burst at about the average speed. Wheels Nos. 14 and 15 were so-called vulcanized wheels, containing rubber in the bond, and intended for particularly severe service. These showed, as was expected, rather more than the average strength.

An examination of the last two columns in the table shows that the wheels burst at speeds varying from two and one-quarter to three and three-quarters the working speed, and accordingly had factors of safety, varying from five to thirteen.

It is then apparent that any of these wheels were safe at the speed recommended, and would not have burst under ordinary conditions. At the same time, considering the violent nature of the service and the shocks to which they are exposed, it would seem that the factor of safety for emery wheels should be large. In comparison with those generally used in machines, a factor of eight or ten would seem small enough.

The fractures were in the main radial, as may be seen from the cuts, the wheel splitting in three, four or five sectors as might chance. It may be assumed that these radial cracks started from the rim where the velocity and stress were greatest, but it is a fact worthy of notice that in nearly every in-

FIG. 6.

FIG. 8.

stance the cracks radiated from points where the lead bushing projected into the body of the wheel.

In this connection the writer would be glad to learn of any published discussions on the centrifugal stresses in rotating discs as distinct from those in thin rings.

The New England manufacturers and erecters of structural steel work, numbering twelve firms, have withdrawn from the National association, which was composed of fifty-six firms.

FIG. 9.

The Alabama Consolidated Coal & Iron Co. expects to blow out the present stack at Gadsden, Ala., about June 20, preparatory to connecting up the new furnace stack just completed there. The size of the new stack is 19 feet bosh, with 85 feet height. This furnace is equipped with skip hoist and automatic filling device complete. A large supply of boiler power and two large Tod engines have been added to the equipment already at Gadsden. The stove capacity has also been increased materially. This furnace, with the material used in that district, should easily have a capacity of 250 tons per day of foundry iron—possibly more. The work has been completed, and unless the company has some trouble in adjusting a new wage scale with the coal miners, the 1st of July, it will blow in the new stack about July 15.

FIG. 10.

The government of the Federated Malay States has imposed a prohibitive duty on the export of tin ore. This action is taken to prevent foreigners from purchasing the ore and shipping it out of the country to be smelted.

TRADE PUBLICATIONS.

Recent literature issued by the Diamond Saw & Stamping Works, of Buffalo, includes circulars describing the company's Sterling back saw blades and frames for cutting steel, iron, brass and tubing. For the use of brass founders, plumbers, brass manufacturers and manufacturers whose products involve tubing the 24-point Sterling saw is especially designed.

FIG. 11.

A 32-page booklet is a reminder of the new and second-hand stock of machine tools handled by the Garvin Machine Co., of New York. No attempt has been made in the present publication to give extended information, special catalogues being employed for this purpose; many illustrations serve, however, to give an idea of the extensive range covered by this firm.

"Electricity in Mining" is the title of the latest pamphlet in the industrial series prepared by the Westinghouse Electric & Mfg. Co., of Pittsburg. A number of interesting installations are illustrated and the economy of electric hauling of coal and ore briefly considered.

The paint catalogue, No. 8, is a special catalogue pertaining to one line among the special machines manufactured by the C. O. Bartlett & Snow Co., of Cleveland. This catalogue has 64 pages with illustrations of paint mills and mixers as well as other machinery for making dry, liquid or paste goods.

FIG. 12.

The second installment of the "Arrow" maintains the reputation of its predecessor and continues the task of promoting the sales of the tin roofing made by the N. & G. Taylor Co., of Philadelphia.

The monthly stock list of Wickes Brothers, of Saginaw,

Mich., Pittsburg and Jersey City, is at hand. A view of the plant at Saginaw is shown. The works cover four blocks and employ 400 men.

Catalogue 61 from the Allis-Chalmers Co., of Chicago has several small views of the different plants. A partial list of users of the Reynolds Corliss engines extends to 190 pages.

The H. W. Johns-Manville Co., of New York, has a pamphlet on "Asbestos Roofing," catalogue R. The use of this material, asbestos, for protection against steam, acid fumes, gases, burning sparks and cinders, is described and the account is followed by a number of halftones illustrating various plants where this roofing is employed. Another circular treats of flange joint gaskets in general and the Kearsage packing in particular. The requirements of an efficient gasket are plainly stated and a list of standard sizes given with prices, etc.

The Derry-Collard Co., of New York, has a neatly prepared paper, "Books and Things," which enumerates a number of good books with useful comments thereon and has something to say about the unique methods of the company in selling technical publications.

The catalogue of the Bates Corliss engine is an excellent piece of work, the pages are 9x12 inches and the illustrations are full page. The engine is built from either of two sets of patterns, the standard box girder engine being adapted for all ordinary and lighter service where the steam pressure does not exceed 125 pounds and the extra heavy duty engine designed for all purposes where the steam pressure is high and where the service is of a severe nature as in rolling mill work. This latter type of engine is also well adapted for driving direct connected generators. These engines are built by the Bates Machine Co., of Joliet, Ill.

Catalogue No. 65 is the 1903 illustrated index of the hydraulic tools and miscellaneous machinery manufactured by the Watson-Stillman Co., of New York, and replaces a similar catalogue, No. 51, issued about four years ago. The present catalogue has 72 pages of illustrations as compared to 44 in the old one, there having been additions in all departments. There is an index of the illustrated sheets of the equipment manufactured by the Watson-Stillman Co., and there is also an account of an improved liquid for use in hydraulic jacks; a fluid which is claimed to have anti-freezing, non-corrosive and lubricating qualities, will not thicken in freezing weather nor cause the valves to stick or clog.

A special circular, No. 38, treats of some of the applications of the jam riveter and the Boyer drill made by the Chicago Pneumatic Tool Co., of Chicago. The tools illustrated comprise the compression riveter already shown in *The Iron Trade Review*, the Whitelaw staybolt nipper, screwed and yoke types of blowoff cocks, bell ringers, etc.

We have received from E. A. Uehling, consulting engineer, 135 Broadway, New York, an interesting pamphlet on the development of pig iron casting and conveying machinery in the United States. This essay is accompanied by one on the advantages of machine cast pig iron. The latter was written by Albert Ladd Colby, the well-known metallurgist, and the former paper was prepared by Mr. Uehling. The pamphlet

FIG. 13.

FIG. 15.

FIG. 14.

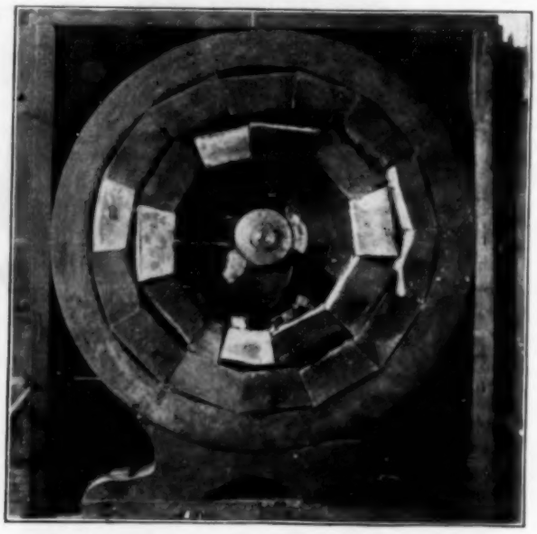


FIG. 16.—METHOD OF ENCASING WHEELS UNDER TESTS.

contains a number of illustrations of the blast furnace and its later development.

The J. D. Smith Foundry Supply Co., of Cleveland, has a complete catalogue and price list, No. 36, which not only deals with supplies for iron and brass molders but contains many items of interest to pattern-makers, machinists and proprietors of rolling mills, furnaces and steel works. The catalogue comprises 320 pages.

The "R. & V." gas, gasoline and distillate engines are described at length in a recent catalogue of the Root & Vandervoort Engineering Co., of East Moline, Ill. The engines are made in a variety of forms and sizes, horizontal, vertical, portable, etc., and for direct connection to electric generators. The latter type of machine is guaranteed to give a steady light up to the full capacity of the outfit and that on an incandescent circuit of from 110 to 120 volts the voltage will not fluctuate to exceed one volt.

The Elliott Electric Blue Print Co., of Pittsburg, manufacturer of drawing materials and surveying instruments, has a new catalogue which extends to 194 pages. The selection of instruments, books and other drafting room equipment is a very complete one.

"Pump Data" Nos. 1 and 2 are devoted respectively to the Aldrich vertical triplex electric pump and the Aldrich quintuplex electric pump made by the Allentown Rolling Mills, of Allentown, Pa. The first of these machines consists in general of a slow speed motor directly connected through single reduction gears to a vertical triplex and the other type of pump is a slow speed motor connected in the same way to five single acting plungers whose crank bearings are placed 72 degrees apart.

The manufacture of cold chisels, punches, lathe and planer tools, etc., is carried on by W. H. Anderson & Sons, of Detroit, Mich., and the firm also makes a line of tools for the laying of artificial stone or cement sidewalks. These tools are the subject of a recent circular and from it we learn that most of these tools are made of brass, three only being of iron, which is of course slightly cheaper and is done to accommodate contractors "who do not give the tools hard service and for those doing only a limited amount of work." This is further explained by saying that unless the iron tools are given special care the action of the cement will in a short time destroy their usefulness, a condition which is claimed will not follow the use of brass tools made from the mixture developed by the company.

The General Power Co., of New York, has a descriptive pamphlet on the Secor oil engine. This engine uses kerosene for fuel and the designer has discarded the vaporizer, and has other features of note which receive attention. Several views of the different types of engines are given but a number of sectional illustrations showing the working parts would have been helpful in following the general description.

The 1903 catalogue of the Grant Gear Works, of Boston, contains a list of ready-made gears, of iron and brass, racks sprockets, chain, worms and worm-gears, etc. The directions and notes compiled on page 4 are familiar to many but cannot be any too well-known and are applicable in other lines. Mr. Grant proposes to avoid blunders in business and outlines a number of the more frequent causes for trouble and his method for avoiding them. The pamphlet also contains suggestions for the computation of bevel gears, drawing spur gears, etc.

The Cutter Nail Co., recently incorporated, has leased a plant at Ashland, Mass., and expects to have machinery in operation by the first of July. It will manufacture all kinds of nails, but more especially horse nails. The company has ordered about $40,000 worth of machinery and has a process of making horse nails which it believes is much cheaper than the ordinary method now in use. The officials are: Solomon M. Cutter, of Lynn, president; James Phelan, of Lynn, vice president; Herbert Pratt, of Swampscota, secretary and treasurer.

The works of the National School Slate Co., of Slatington, Penn., have been equipped by the B. F. Sturtevant Co. with complete heating and ventilating apparatus, using the hot blast system. The air is drawn through a steam-pipe heater by a fan, direct-connected to a horizontal, side-crank engine. The heater is built in five sections, one of which is designed to use the exhaust steam from the engine.

THE HANGING ROCK REGION.

IRONTON, O., June 22.—The strike at the four firebrick plants at Oak Hill, Jackson County, involving about 400 men and in progress for some weeks, was settled last week.

The Ironton Disc Plow Co. has elected the following officers: President, E. J. Bird, Jr.; vice president and manager, W. E. Reynolds; secretary-treasurer, L. G. Browne. Messrs. Browne and Reynolds are from Chattanooga. A committee was appointed to secure a site for the factory, and the company expects to market its product within 90 days.

The strike of the C. & O. machinists and boilermakers at all shops between Hinton, W. Va., and Cincinnati, has been settled, the men being out six days. The settlement was on the basis of an intimation that the company would remove Councilman Davies, of Huntington, W. Va., over whom the strike occurred. It is understood that Davies will be given a better place in another department of the service.

Dudley C. Hutchins, L. C. Turley, S. P. Adams, J. W. Bannon and Simon Labold, of Portsmouth, have organized the Pioneer Coal Company, with $300,000 capital and will develop several thousand acres of coal lands in Washington township, Lawrence Co. They will install electrical machinery.

The blooming mill at the Portsmouth Steel Co. plant resumed last Wednesday. Two of the steel furnaces are on while the other two are idle, owing to the fact that the tracks for the new charger are not laid.

The citizens of Pomeroy have raised about $15,000 on a bonus to secure the removal of a rolling mill from Hartford City, Ind., and will also donate the site of the old Pomeroy rolling mill.

The plants still in enforced idleness here and at Ashland by reason of the iron workers' strike at the latter place, for recognition of the union, are Norton Iron Works Co., Ashland Steel Co. (sheet and rod mills), Belfont Iron Works Co., and Kelly Nail & Iron Co. The producing company on which the majority of the plants depend, is willing to pay the Amalgamated scale, but declines to operate anything but an open mill. No attempt at a settlement has been made in the past week and the industrial situation in this section of the valley is serious, as an epidemic of strikes in the wood-working line has closed the lumber mills. The labor difficulties at the Ironton foundry also remain unsettled.

A movement is on foot, backed by a well-known iron manufacturer, to organize a company to manufacture tacks, the owners of the Ironton Tack Co. plant, recently destroyed by fire, having decided not to rebuild. The plan is for a much larger plant than the one burned.

A Portsmouth company recently formed to manufacture an automatic shoe-lace salesman, constructed of iron and nickel, will establish a plant at Portsmouth.

Col. H. A. Marting, president of the Columbus Iron & Steel Co., the Marting Iron & Steel Co. and other concerns, has just returned from Chattanooga, Tenn., where he went to look after the interests of the Valley Iron Co., of which he is an officer. The company has erected a blast furnace at the foot of Lookout Mountain, 35 miles from Chattanooga, and surrounded by 15,000 acres of mineral land, on which is a four-foot vein of good iron ore, a 3½ foot vein of coking coal and a fine stratum of limestone. They go down 400 feet for the ore, sinking two shafts right at the furnace and elevating the ore with electrical power direct to the furnace. The coal is drift-mined out of the mountain above the furnace, coked there and carried by gravitation. The plant is one of the largest in the South and probably the only one in the country favored with such labor-saving conditions.

John Scherer, foreman of the Portsmouth Stove & Range Works, will accept the superintendency of the Faultless Malleable Range Works in Chicago, July 1.

When the Eagle plant of the Republic Iron & Steel Co. here was closed down some months ago, the announcement was made that the suspension would be until July 1, but the plant could not now be put in shape for operation by that time and it is considered as abandoned, so far as future production is concerned.

The Loomis-Pettibone Mfg. Co., New York, has recently secured a contract from the Velardena, Mexico, for a gas engine plant, which will have a capacity of 2,000 horsepower.

The Heating and Ventilation of Shops and Foundries.*

BY W. H. CARRIER.

It is the purpose of this paper to set forth, first, the nature of the difficulties to be overcome in the satisfactory heating of shop buildings, and second, to show the adaptation of the fan system to the solution of these difficulties. Although machine shops and foundries are perhaps the simplest type of building, the problem of their successful heating is one of the most difficult. Heat losses occur in the building from two causes; first by the direct transmission of heat by radiation through the walls and exterior surfaces of the building, and second by the infiltration of cold air from without. In designing a heating plant, the first of these losses may be very accurately determined by referring to tables which have been prepared showing the amount of heat radiated under different conditions through various thickness of walls, windows, doors, roof, etc. The heat lost through infiltration varies so greatly in various sizes and construction of buildings that no definite rule can be given. The allowance to be made for this is necessarily a result of experience and careful tests of previous installations.

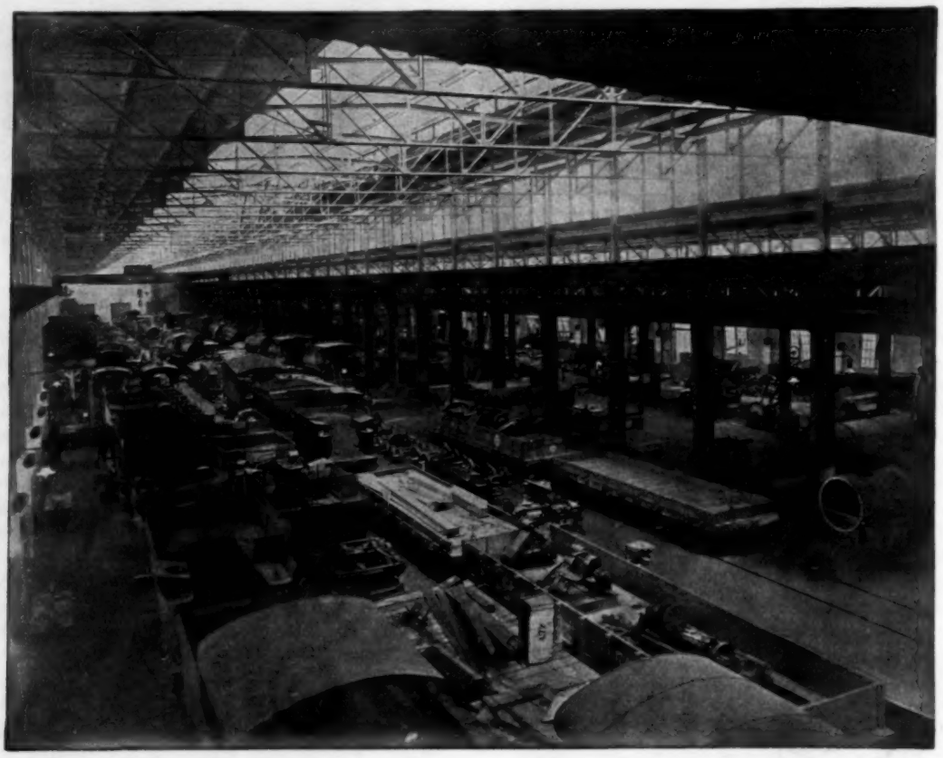


FIG. 1.—HEATING SYSTEM IN NEW JERSEY CENTRAL LOCOMOTIVE REPAIR SHOP, ELIZABETHPORT, N. J.

Difficulties to Be Met.

In either fan or direct radiation systems difficulty is liable to be experienced from the heated air immediately rising and forming a stratum of heated air just beneath the roof. In machine shops and foundries, owing to their height and to the great amount of skylight surface which is always provided in the best modern construction, the loss occasioned by this action of heated air may be considerable, and its prevention is a serious problem. In direct radiation, since the air currents are produced entirely by heating, the loss in this manner is very great, and cannot be prevented. Practically the only way by which any useful effect from this heated air can be realized is by placing the coils next to the wall near the floor and allowing the heated current to pass upward along the walls; but even this is wasteful from the fact that it heats the walls unduly. With the fan system, however, the distribution of the heated air is entirely mechanical and affords an opportunity for utilizing its heating effect to the very best advantage. Various methods of distribution have been devised with the fan system whereby the effect of a rising current of heated air is almost entirely avoided. These systems, in general, depend upon securing a perfect diffusion of the heated air along or near the floor line and will be described in detail later.

A second difficulty experienced in high buildings, such as machine shops and foundries, is the effect due to outward leakage of the heated air at the upper part of the building and a consequent inward leakage of cold air along the floor line. This leakage is produced by the unbalanced pressure of the columns of heated air within the building, and that of the cold air without. The effect is in principle precisely that of a chimney. The difference in pressure produced can be measured in inches of water, and increases in direct proportion to the difference in temperature between the air within the buildings and that without. Since the flow of air is proportional to the square root of the pressure the amount of air entering or leaving the building through leakage will be in proportion to the square root of the difference of temperature. The effect of this leakage is as evident in theory as it is noticeable in practice.

The air which escapes from the building is naturally the very hottest and therefore has not had its heat fully utilized; while that which enters along the floor chills the air at the lower part of the building very noticeably, forming a cold layer of air which cannot be removed except by some means of positive circulation or diffusion with heated air as secured by the fan system. In large machine shops and foundry buildings this layer of cold air may frequently be found to extend from 4 to 6 feet above the floor, while the amount of heat lost due to the high temperature in the upper part of the buildings may be much more than sufficient to secure a satisfactory heating effect throughout if properly applied. The most effective remedy for this evil is to maintain a slight pressure within the building by means of a fan which takes a portion of its air from without.

A third difficulty presenting itself in buildings covering large area and having a large amount of skylight, is the cold down draft, which the cooling effect of the skylights has a tendency to produce. In very wide buildings where heat is distributed only along the walls this effect is noticeable, and as it

*Read at the Milwaukee meeting (May, 1903) of the American Foundrymen's Association.

comes directly upon the heads and shoulders of the workmen, and is in the part of the building most used, it is very objectionable. However, with the fan system it can easily be remedied by causing a flow of heated air toward the center of the building.

Two Methods of Heating.

In general buildings may be heated in two ways—first, by keeping the walls and roof warm. This is accomplished in direct radiation system by placing coils along the walls, and in the fan system by blowing the heated air toward the walls.

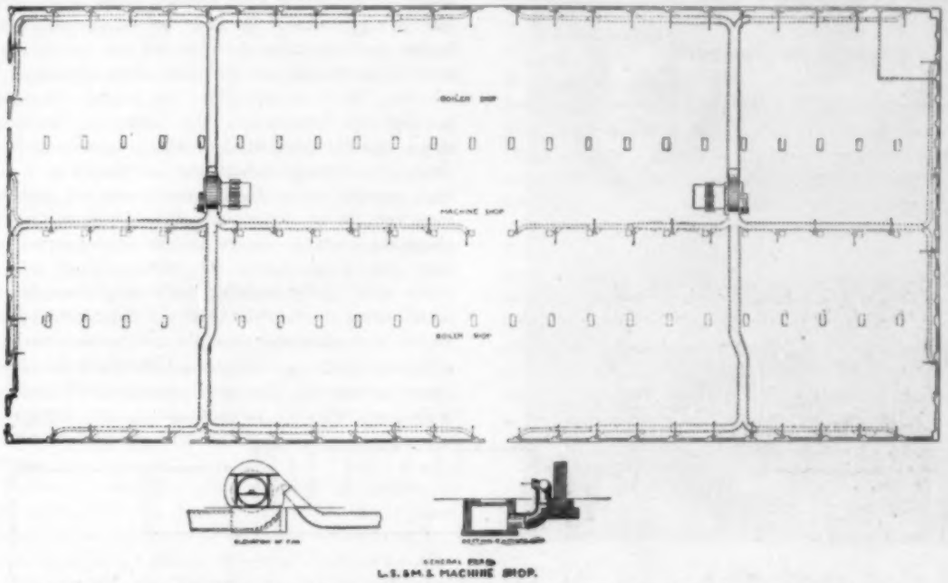


FIG. 2.—L. S. & M. S. SHOPS, COLLINWOOD, O. ANOTHER EXAMPLE OF THE VERTICAL DUCT SYSTEM.

A second method is to heat the air within the building directly. This can be accomplished in a satisfactory manner only by an indirect or fan system. Of these two systems it may be said that if either is used exclusively the second method is preferable, since it is the more economical. In the first method it is quite evident that if the walls be kept warm, radiation will not occur to any great extent from the interior of the building, and the heating effect will be satisfactory. On the other hand it is equally evident that the radiation through the walls caused by heating them to a higher temperature occasions a much greater radiation loss than would occur if the room temperature had been secured by heating the air directly. Since the heat transmitted by wall coils is chiefly direct radiation, the loss occasioned by the direct transmission of heat through the walls with this system is very great and may be as high as 25 percent or more of the total radiation.

Systems of Air Supply and Distribution.

With the fan system the method of supplying and distributing the air in the building is the consideration of chief importance. The usual methods of supplying heated air are, first, where the air is taken entirely from without doors and is forced directly into the building through distributing ducts. This method is generally known as the plenum system, and the pressure produced in the building causes a continuous exit of air from the building, either through the natural openings, as is usually the case in factory and other large buildings, or through special vent openings provided for the purpose, as in public buildings.

A second and more common method of shop buildings where forced ventilation is not a necessity, is to draw the supply of air entirely from within the building and again forcing it through the distributing ducts. This causes a continuous circulation of the air within the building, and when properly applied secures excellent results.

The first of the above methods has the advantage of securing an excellent ventilation, and in the instance of foundries this is often desirable. Another advantage possessed by the plenum system is that it produces a continuous outflow of air through all the crevices and openings in the building which would otherwise be admitting cold air from without to settle along the floor and prevent satisfactory heating. In buildings of loose construction this is frequently the only system which can be successfully operated. The air return system often has an advantage over the plenum system in that all the heat supplied to the air is effective in heating the building, but does not possess the advantage of producing a plenum in the building.

SECTIONAL ELEV. ON A-B
AIR RETURN DUCT.
GENERAL PLAN, LOCOMOTIVE REPAIR SHOP
PHILADELPHIA AND READING R.R. CO.
AIR RETURN DUCT.

FIG. 3.—DISTRIBUTED AIR RETURN SYSTEM.

The ideal system is a combination of the plenum, and return systems and should always be used where possible. In this system the great portion of the air is returned to the apparatus, but sufficient air is continuously taken from with-

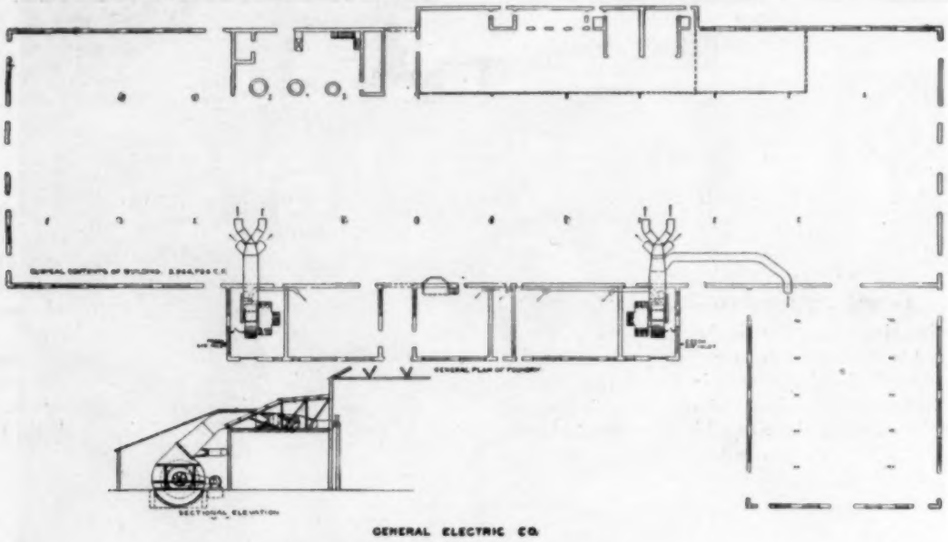
out through a fresh air connection to create a plenum within the building and prevent the inward leakage of the cold air along the floor. In this manner the natural leakage is supplied, not by in-flow of cold air through the crevices around the doors and windows, but by air passed through the apparatus and heated to an effective degree. This system has been found by test to be more economical than air return alone. The proper amount of air to be introduced from without is determined by securing a point where the noticeable inward flow of air around the doors and windows ceases. If the plenum is carried beyond this point, there will be a loss due to unnecessary heating of the outdoor air.

Systems of Air Distribution.

There are several systems of distributing the supply of heated air. A method usual in public and office buildings and sometimes employed in factory buildings is the vertical duct system by which the air is admitted through vertical ducts or flues built in the walls at a point about eight feet above the floor. Suitable openings are supplied at the floor line for the air that is forced out. By this method the air is continually forced downward as it cools and the cold air is always removed at the floor line. A method of distribution quite similar to this is one where the air is first blown into brick ducts placed underneath the floor. From these ducts vertical galvanized iron risers are arranged along the walls. These are so arranged as to blow downward and away from the wall at a height of about eight feet from the floor. These outlets should be adjustable so that in case too direct a draft is caused in any portion of the building the outlet can be diverted in some other direction where the air current will not be objectionable. This method is well illustrated by an installation of the Buffalo Forge Co. placed in the locomotive repair shops of New Jersey Central at Elizabethport, N. J. The general arrangement may be seen in Fig. 1.

This system is also frequently very successfully employed in foundries. Advantages of this system are: first, that there is no overhead piping in the way of cranes etc.; second, that the greater portion of the distributing ducts are brick and are not subject to deterioration. The third, and principle advantage is that the air can be distributed by this means where most needed. This system is sometimes somewhat modified by placing the outlets close to the floor and blowing downward directly along the floor. This secures a perfect diffusion of the heated air at the floor line, and avoids any drafts which would be objectionable. A good example of this type of installation is shown in the heating plant which was installed by the Buffalo Forge Co. at the Lake Shore & Michigan Southern machine shops at Collinwood, O. The general arrangement for air distribution is shown in Fig. 2. It will be noted that the apparatus consists of two duplicate sets placed in the center of the building, and that a line of distributing ducts is placed around the entire building with an additional distributing duct running from the center of the building. This was necessary on account of the great width of the buildihg which consists of three shops united in one.

Another system which has proved very satisfactory is that in which a distributed air return duct is employed. This approaches very closely in principle to the plenum system used in public buildings and is a combination of both plenum and exhaust systems. This may be best described by referring to the heating plant installed at the Philadelphia & Reading shops at Reading, Pa., shown in Fig. 3. In this instance, instead of employing one or two large units, seven separate sets of apparatus have been provided, placed in small fan houses built at intervals at either side of the building. The peculiar feature in this and similar installations is that no distributing ducts or piping for the heated air are used, the air being blown directly into the building at about 8 or 10 feet above the floor through an outlet branching in three directions, and through which the air passes at a comparatively high velocity. The distribution is effected entirely by the return vent ducts, which are distributed at frequent intervals along the walls as shown in the accompanying figure. These open into large return air tunnels which are provided on either side of the building and serve the additional purpose of affording a convenient place for locating steam and water mains, and also electric light and power mains. Provision is made for taking a portion of the air from without doors to secure a plenum. One great advantage of this system is that it removes all cold air leaking into the building at the floor line as well as that produced by the cold down draft next to the walls. Further a perfect distribution is secured in all parts of the building, and the cost of installation is reduced to a minimum. In small buildings a system of distributing outlets are placed along the further side of the building, and a system of vent ducts opening into exhaust chamber are placed on the side adjacent to the fan.



GENERAL ELECTRIC CO.

FIG. 4.—LIMITED DISTRIBUTION SYSTEM.

Excellent results can be secured by the use of overhead piping, providing it is not placed at too great a distance above the floor. The chief advantage of the overhead system is the saving in first cost, since on account of the high temperature and velocity of air in the distributing pipes, a great amount of heat can be transferred with a very small amount of material. The cost of the galvanized iron distributing system of air ducts is usually a small portion of the total cost. The best results are secured with outlets at from 12 to 18 feet. Above this height it is preferable to use drop pipes extending downward along the columns where they will not interfere with traveling cranes. Such a system of overhead piping is very frequently employed in foundries; although in machine shops the underground system is nearly always preferable.

In many instances a system of elaborate distribution is impracticable or undesirable. In such cases a centrally located apparatus or discharge pipe may be used. From this point

the air is blown in all directions, and a circulation is produced by an exhaust connection to the fan inlet. In such instances very effective heating has been secured even where it was required to blow the air long distances. Perhaps as good an example of the successful operation of such a system may be found in the Buffalo Forge Co.'s installation in the foundry building of the General Electric Co. at Schenectady, shown in Fig. 4. This foundry, which is probably one of the largest in the world, is heated in an entirely satisfactory manner with a few large branch outlets. Since the plant was installed, a large addition has been built on one end of the building. This addition is satisfactorily heated by a branch inlet situated at over 200 feet from the further end, which shows how thorough a distribution may be secured by a forced circulation.

Together with the advantage of the fan system in securing a satisfactory and economical heating with any desired degree of ventilation, it combines a saving in first cost, and economy in regulation, and convenience in operation, to a greater degree than any other system.

The required amount of heating surface in the fan system, on account of its greater efficiency, is reduced to less than one-third that necessary in direct radiation.

This increased efficiency is due to a larger volume of air being brought into contact with the pipes than in direct radiation. It has been found by experiment that the radiation from the fan system heating surface increases more rapidly that the square root of the velocity. Hence the higher the velocity secured over any heating surface, the greater will be the radiation.

With any heating apparatus a point of chief importance is the economical utilization of exhaust steam. The fan system heater on account of its design with reference to securing the most circulation of steam, removal of air and return of condensation secures an effective operation with the minimum amount of back pressure on the exhaust line. When an engine is employed in driving the fan the effectiveness of the exhaust in heating is nearly as great as that of the live steam. Hence the cost of power is practically nothing.

Canada Against Protection.

In the Canadian House of Commons last week the following resolution offered by R. L. Borden, was voted down:

"This House is of opinion that the tariff of customs duties should give such protection to iron and steel industries as will not only secure to our own producers and manufacturers the Canadian market in articles now produced or manufactured in this country, but will also develop and sustain the manufacture in Canada of other iron and steel products which at present are imported in large quantities from other countries. And that the present tariff of customs duties should be now readjusted on this principle."

Mr. Borden spoke at length. He showed that in all countries, Great Britain not excepted, the iron industry had required protection in its early stages. He instanced the magnificent progress made by this industry in Germany and the United States under the protective policy and the comparative stagnation in Great Britain under free trade. He pointed out that Canada has all the natural resources and only needs to have the home market assured to her own manufacturers in order to guarantee development.

Mr. Fielding's reply was brief but quite clear, as far as it went. He declared flatly the Government would do nothing at present. His position was that the motion was "inopportune" and that until something else happens, the duties must remain as they are.

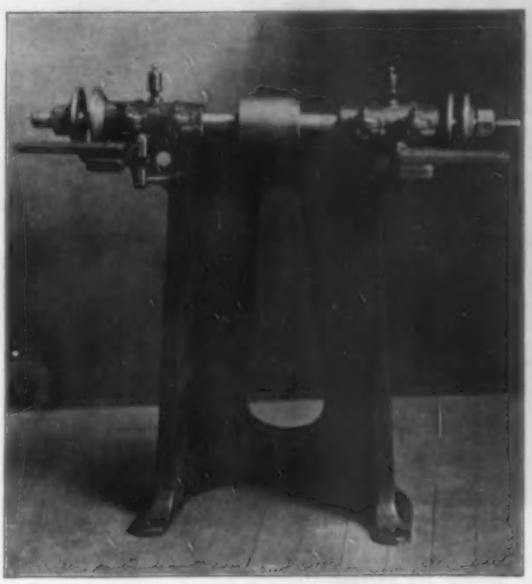
Sir Wilfrid Laurier also spoke shortly. The burden of his speech was that those who were asking for more protection had not laid before the Government such a full and convincing statement of their situation as might fairly be demanded under the circumstances.

In the division which followed the Government was sustained. Two Conservatives voted with the majority, as did also one Independent. The vote was 47 to 91.

The blast furnace at Grand Rivers, Ky., is out of blast temporarily.

A NEW GRINDER.

An emery grinder brought out at the J. C. Born & Bro. Machine Works, of Belleville, Ill., has been designed for belting either from below the floor or from the overhead countershaft in the usual manner. The means by which this has been accomplished will be best understood by an examination of the halftone and noting the peculiar shape of the bed. The



A NEW GRINDER.

machine is intended to carry two wheels, 2½x16 inches, and has a spindle 1 7-16x36 inches. The diameter of the spindle between the flanges is 1¼ inches and the length of bearings is 7½ inches. The pulley is 4x4 inches, diameter of flanges 5 inches. Distance between wheels 26 inches and the height from floor to center of spindle is 31 inches.

Large Rail Orders for 1904.

The following statement concerning the iron and steel schedule for 1904 was made June 19 by Elbert H. Gary, chairman of the executive committee of the United States Steel Corporation:

"The price of steel rails for the year 1904 has been fixed at $28, at the mill, the price which has obtained during the last three years. As the full capacity of all the mills for the next seven or eight months has been sold, many of the leading railroad companies have expressed a desire to have the price of rails established for next season, and action has been taken a little earlier than usual. Upwards of 250,000 tons for 1904 have already been booked, and inquiries for a large additional tonnage have been received during the day. No change in the price of other lines of steel has been contemplated."

The report having been freely circulated that the price fixed on rails for 1904 and the prices on other steel products were subject to reduction on contracts now entered into, in case the market should decline in later months, Chairman Gary took occasion later to say for publication that there was no such arrangement, all contracts being unconditional.

The order of the Pennslyvania Railroad was placed for 1904 immediately on the announcement of prices. It is for 202,000 tons, of which 118,000 tons will go to the steel corporation and 42,000 tons each to the Cambria Steel Co. and the Pennsylvania Steel Co. The Harriman order for 100,000 tons of rails referred to as placed one week ago, is now reported to have been given, the greater portion going to the Colorado Fuel & Iron Co.

The machinery of the John Dunlap Tin Works, Pittsburg, has been removed to Carnegie, where a new plant has been erected. The concern is one of the oldest in Pittsburg, dating back to 1839. It was destroyed in 1845 by fire, but was rebuilt on a more extensive scale.

Molding Machines.*

BY EDWARD B. GILMOUR, PEORIA, ILL.

The introduction of the molding machine into the foundry has been the cause of many a heated argument. Articles have been written and discussed from a trades protection stand-

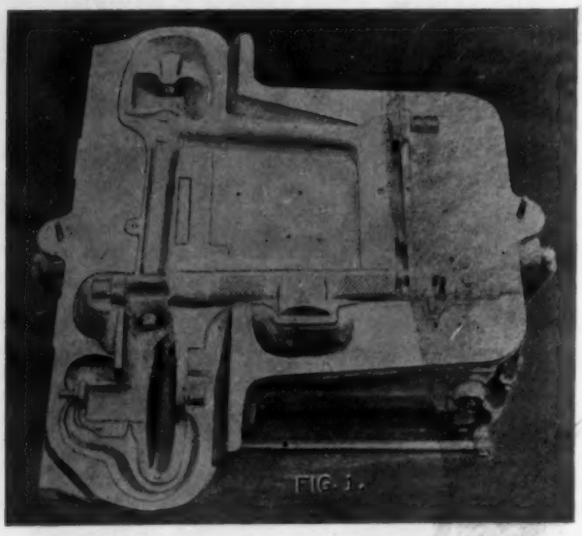


FIG. 1.

point, also from the standpoint of the incessant demand upon the market for increased production of certain articles, thus necessarily compelling the foundrymen to wake up and follow the demand.

The molder refused to work upon these machines, or at least refused to put up the amount of work necessary to pay for the investment, simply on account of the fact that he became a mere automaton. The mechanic who worked these machines was a mere pounder of sand, and consequently, in order to bring the machines into successful use, the manufacturer was compelled to employ unskilled labor. The molding machine has been in the foundry for a number of years, but only recently has it received the attention it deserves, and that simply because completion has made the progressive foundrymen devise the most effective and economical methods to produce the best results, and at the same time get as near as possible perfect castings.

One of the most advantageous positions to be attained in

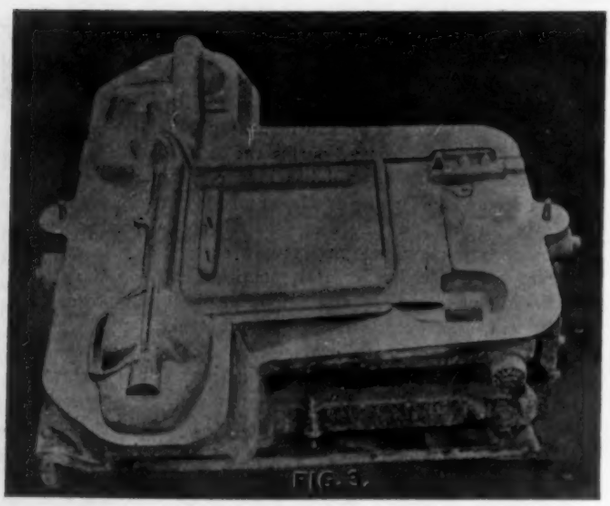


FIG. 3.

a successful foundry is the ability to carry on the work in the least possible amount of space, more especially in prosperous times when floor space is at a premium, all foundries being then too small for their requirements. Here is where the molding machine comes in. In the first place plate molding was resorted to on account of the accuracy of the castings made thereby, the patterns did not have the rapping, shaking, and twisting which is usually given in order to get them out of the sand, and as a natural consequence the castings were more perfect and in many cases could be used in the rough state without any machine work having to be done on them. Afterwards the more improved method of the stripping plate was introduced, which is giving very satisfactory results. The great aim of the manufacturer of molding machines is to do away with the ramming of the sand. In a great many cases he has been very successful, but as a rule only upon what may be termed flat backs.

The great trouble with the "squeezer" is that it makes the outer surface of the mold so hard that it is difficult for the gases to find an easy exit through the sand. In order to obviate this trouble, a loose frame the size of the flask, about one inch and half thick, is placed over the top of the flask so that when the mold is squeezed this frame is removed and the hard surface of the sand scraped off in line with the flask. Another difficulty in employing squeezing machines is that there is a large amount of sand right about the operator's feet. In order to get rid of the sand the conveyor was designed so that the sand as it is required would simply drop down upon the flask. This again has not proved as successful as might have been expected, because in many instances just as much work is accomplished by the use of the shovel, thereby saving the very expensive conveyors and shortening the great distance necessary to carry the flasks from the machine to the floor. The same principle holds good in this as

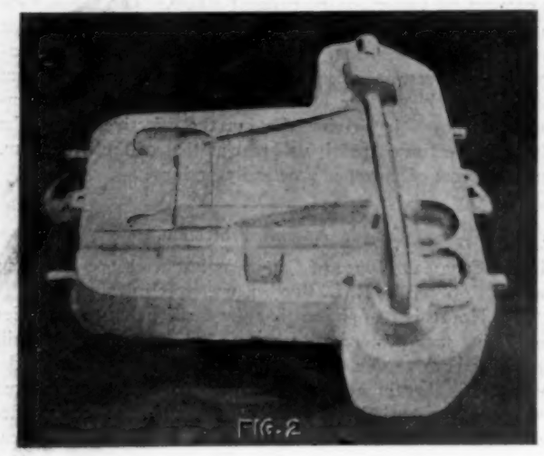


FIG. 2.

it does in the old style of "snap benches" which are fastened to the wall as against the new style which have casters attached, this also being the case in some of the hand squeezers, so that they can be moved about as the sand is used up.

The method of making stripping plate machines is very simple, and in many cases almost as cheap as would be the regular gate of patterns with match board. This will be seen from the following cuts. A flat plate is cast having a hole cut the shape of the pattern with about ¾ of an inch clearance around the pattern. Slots or nails are put in the edges of the plates to hold the soft metal, a very good composition for which is 8 parts of tin, 4 of lead, and one of bismuth. This metal is very fusible and is poured around the pattern into the clearance space. The patern is then taken away and the lower edge is beveled to reduce the friction in dropping the pattern when the mold is made.

Fig. 1 is the drag part of a complicated stripping plate drop pattern machine for molding mower frames. The first cost of this machine is great, but when you consider the difference in cost of the castings, it would be cheap at double the price, as the reduction in cost in this instance is over 75 percent.

Fig. 2 is a mold made from this machine with all the cores set in position. Fig 3 is the machine to make the cope part for this mold. It is exactly the opposite shape. Fig. 4 is a mold made from this machine. The flask for the drag part is made with only a few bars to strengthen it, and when rammed up it is clamped to the machine, the whole being lifted up

*Read at the Milwaukee meeting (June, 1903) of the American Foundrymen's Association.

and rolled over by means of trunnions attached to the machine. It is then set down, the pattern raised, the machine lifted off, rolled back, and ready for another. The cope part is barred up very carefully in order to save trouble in setting gaggers, which are usually very few. Fig. 5 is a wheel molding machine for forming the drag part. Fig. 6 is a mold made from the cope part of this same machine. Fig. 7 is a stripping plate machine of a very simple but ingenious design which can be used to make almost anything of a circular nature.

At one time I observed a machine which suggested several ideas to my mind and with which I have made some very complicated castings reducing their cost fully 25 percent, and giving perfect work. You will observe that there is only one pin in the plate, one pin in the cope and one in the drag. For this machine we use a well-made snap flask with the holes absolutely perfect. The flask is made of good seasoned lumber. The pins are turned of tool steel. The plates are planed all over. The sides are planed parallel to each other in order to divide the patterns equally. Grooves are cut into the plate half the depth of the core. A spindle is used the exact size of the core, which serves as a coreprint, except when in large cores a coreprint is turned up with the pattern. The greatest difficulty in making this machine was to get all the patterns absolutly the same in order to have a perfect duplication. This difficulty was got over by our pattern-maker who designed a very simple but ingenious contrivance which is attached to the tool holder of the turning lathe, an illustration of which is reproduced in Fig. 8, showing the tool

FIG. 5.

for inside work, and in Fig. 9 which shows the tool for outside work. We are now constructing a large number of these machines, a great advantage of them being the fact that we only use one plate, and there is no need of the expensive stands and levers. You simply place the machine upon a regular snap bench. The object in using snap flasks is that it saves a large amount of stock flasks; they also are much easier to shake out after being cast. We have endeavored to keep all plates as near as possible the same size so that any flask will fit them.

Equity proceedings were begun in common pleas court at Philadelphia, June 18, to prevent the proposed increase of the capital stock of the William Cramp & Sons Ship and Engine Building Co. from $5,000,000 to $6,250,000, and the mortgage indebtedness from $6,800,000 to $7,500,000. The complainants are two stockholders, John W. Grange and Andrew H. McNeal, who bring the suit on behalf of themselves and any other stockholders who are opposed to the increase of stock and may wish to join in the proceedings. In the bill it is explained that the company's stock has been several times increased, and at present consists of 50,000 shares of the par value of $100 each. Of this stock McNeal owns 350 shares, while his co-complainant is possessed of 100 shares.

Both stacks of the Woodstock furnace at Anniston, Ala., are out of blast for repairs.

BUYING PIG IRON ON SPECIFICATION.*

BY HERBERT E. FIELD, ANSONIA, CONN.

History has in truth repeated itself and we are again face to face with a declining pig iron market. Some are prepared to take advantage of the drop in price of material to fulfill contracts based upon the higher prices. Others, however, are now receiving iron bought at a high price for previous delivery and

FIG. 4.

are fearful lest the decline in raw material be accompanied by a like drop in the price of castings.

We have little sympathy with the man who, from lack of foresight, finds himself with a large amount of high priced iron and a declining market. We have sympathized with the one who had foreseen the rise and had bought liberally to cover future needs and then through failure of the furnace to fill the contract, was forced to buy spot iron at top of market price to use in place of the iron contracted for at a much lower figure.

The use of specifications in buying pig iron is becoming quite general. An old saying that "A little knowledge is a dangerous thing" applies in the iron business as well as elsewhere. But let me change it a little: "A little specifying is a dangerous thing," and it will stand very well for the text of my paper.

Man has from the beginning found excuses for wrong doing, or failure to do what was right. Some pig iron furnaces have, in previous changes in the market, found excuses for failing to fulfill contracts. We have, however, given them better excuses by

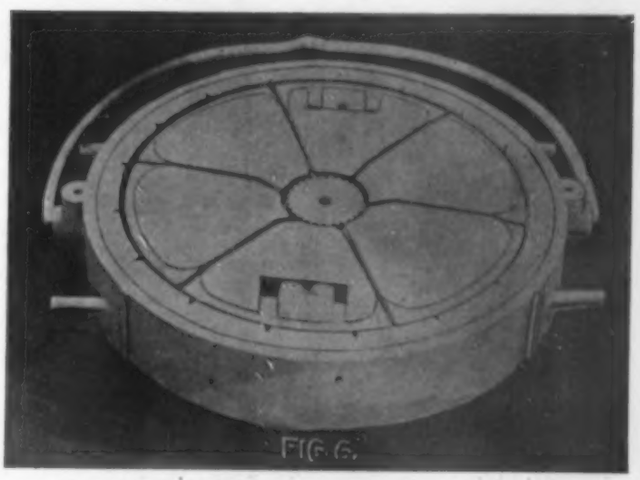


FIG. 6.

placing analytical specifications in their hands. Some of them have been quick to make use of the excuse. Previous to the last phenomenal rise in pig iron, many buyers, taking lesson from previous experience with poor iron shipped from furnaces forced beyond their capacity, very shrewdly bought their iron upon specified analysis. They were sure then to get good

* Read at the Milwaukee meeting of the American Foundrymens' Association, June 10, 1903.

iron, or they could reject it. So far so good. Let me illustrate how this turned out in many instances. The founder bought at a low price, say $16 for future delivery. The time comes for the delivery. If he gets it he may find it does not come within the specifications but is inferior iron. He complains and is very politely informed that the makers are most sorry, and that they will see that the iron is taken out, as they have a customer for just that grade. They agree to replace it with iron within

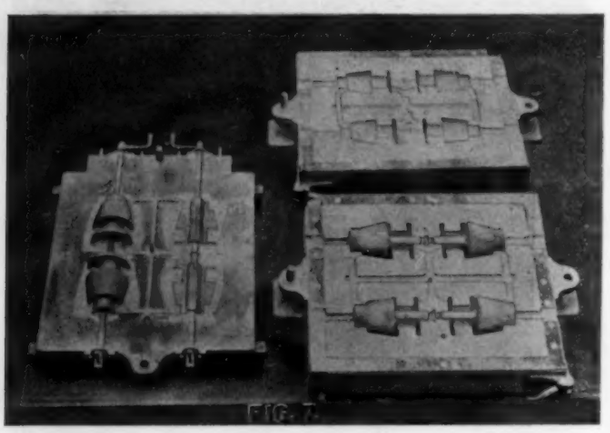


FIG. 7.

specifications, but the furnace is running "off" a little just now, coke is bad and scarce, and their furnace is running on a lower grade. As soon as it rights itself they will ship the desired kind. They regret the circumstance and are sorry to inconvenience their customer, etc., etc. You have all read it and heard it; have dreamed it as you saw your iron pile grow low and the price grow high. Your faith in human nature increases as you weep in sympathy with the furnaceman in his sorrow at not being able to supply the grade that you must have. You can see how pained he must be that he really cannot make the iron which he must sell you at $16, but that he can only make a lower grade and sell it on the increased market at $20 to $22. You can see how hard it must be for him when he is forced to accept $4 to $6 a ton more for a No. 3 when he really could be making a No. 1 or No. 2 at a greater cost and selling it to you for less money.

What are your specifications worth now? You must buy a high grade iron to mix with it or stand the complaint of your customers on account of inferior castings. If you order the

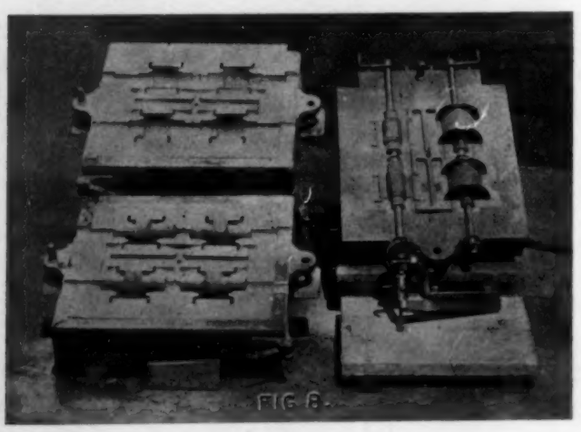


FIG. 8.

iron to be taken out, you must buy iron to replace it at a greatly increased cost and your foresight in buying on a low market nets you nothing. Some of you may say that such a one was fortunate to get any iron at all. It would almost seem that some furnaces purposely run on grades which could not fill the wants of their customers and then sold the product at a better price than they would have received on their contract for the higher grades. It is difficult to resist the temptation during such times to run furnaces beyond their capacity for making high grade irons. It is a strange coincidence that when the price drops below that for which the iron was contracted, the furnace generally gets "on" again and makes a few hundred tons just to fill the order. You are glad to see it coming, especially if you have filled your yard with iron at a high price. You realize that if it had come in when it should you would have been thousands to the good. You feel towards that iron as the other son did to the prodigal.

You say these have been exceptional times. They surely have. Two such times in six years should furnish about all the experience that is necessary. I bring this subject up for consideration at this time in hopes that foundrymen will do something to prevent a third. That furnaces can fulfill specifications is shown whenever the supply exceeds the demand and there is competition for orders. There may be a certain satisfaction at such times, in refusing to take iron which does not come up to specifications, but this does not tend to a steadiness which is best suited for prolonged prosperity.

We hear repeated statements that the modern furnaceman is not only willing but anxious to sell by analysis. To be sure this anxiety is often proportionate to the amount of iron he has to sell. Let us, however, assume for discussion's sake that the furnace can and will sell by analysis. Specifications and standards are two of the key notes in modern industrial advancement. The American Foundrymen's Association has for some years realized the importance of standards in up-to-date foundry practice. Its work on standard test bars was monumental in its extent and it has laid a foundation for the testing of cast iron. The work of its standardizing committee in pre-

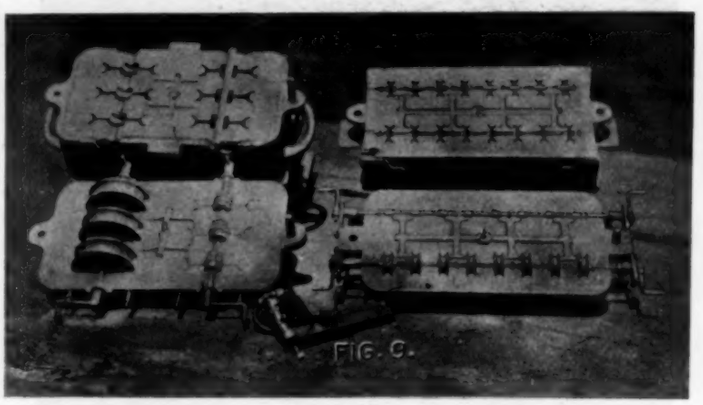


FIG. 9.

paring standard samples for analysis has given the Association a world wide reputation in that line. The Metallurgical Section is at present working on standard methods for analyzing iron. Standard methods for sampling pig iron have been submitted to this Association for approval. Standards tend toward stability, and anything which lends stability to business, whether it be stocks or foundry business, should be encouraged. Will standard specifications for the purchasing of pig iron overcome the difficulties which so many have experienced in the last year or two?

The American Society for Testing Materials has appointed a committee to take up the matter of standard specifications for pig iron. The writer desires, if possible, to introduce a discussion among the users of pig iron in order to bring out the sentiments of those who will be the most benefited by such specifications. Specifications may look well in print; they may show the best thought of the experts engaged in drawing them up, but they will be useless unless they are given the support of the buyers of pig iron. Will it be possible to draw up specifications which will cover emergencies and prevent the difficulties to which I have previously alluded? If this is not possible then they will not be worth the paper on which they are printed, to say nothing of the labor of getting them up. As matters stand now in the pig iron business, when the supply is equal or in excess of the demand, if a foundryman knows what he wants, he can get it without regard to standard specifications. If, however, the demand exceeds the supply, and the market is rising, the purchaser is pretty apt to take what the furnaceman sends him and be very glad to get iron, regardless of whether it fills the specifications or not. The utility of specifications

will depend upon two facts, first, the inherent value of the specification itself, in being so framed as to prevent the above difficulty, and second, the support given the specification by the purchasers of pig iron.

What ranges in analysis shall constitute each grade? How great a variation shall be allowed from the specifications? What shall determine the true grading of the iron? How shall it be sampled and analyzed? These are a few of the important questions to be covered by specifications, but they are not enough. Specifications must be framed so as to guarantee to the founder the product that he has bought. If iron is bought at a contract price on a guaranteed analysis, the order should include a clause which gives the buyer an option to accept or refuse the iron if it does not come within the guaranteed specifications. It should go further, it should give the buyer the privilege of accepting the iron at a reduced price; the reduction to be covered by the specifications and not left to argument after the trouble has appeared. For example, a purchaser buys pig iron of guaranteed silicon 2.50 to 3 percent; sulphur, .03; phosphorus, .7, etc When he receives this iron he finds it runs 2 percent in silicon, .06 in sulphur and 1 percent in phosphorus. The purchaser should have the option of a fixed reduction in price guaranteed by the specifications. The price should allow him so much per ton reduction for every .25 of 1 percent in silicon that the iron falls below the specifications. It should allow him a fixed amount for every .01 of 1 percent of sulphur and every 1-10 of 1 percent in phosphorus by which this analysis exceeds the guarantee.

The benefits to be derived from such a specification are obvious. In the first place it would make the furnaceman more careful in selecting the iron to fill such orders. He could not feel assured, as many have been able to in the last shortage, that the iron would be accepted and paid for whatever it was. In the second place it would give to the purchaser a reduction in price which would repay him for the excess in percent of pig iron that he was obliged to carry in his mixture, or it would allow him to purchase high silicon, high manganese or low phosphorus iron to mix with the inferior iron and bring it up to the required standard without increasing the cost of his mixture. Such specifications would overcome the chief difficulties which founders have experienced in buying on specified analysis. These difficulties as stated earlier in the paper consist of the indifference which furnaces have shown in fulfilling specifications in rush times, and the use which they have made of the specifications to excuse them for not shipping iron bought at a low price, when the price has advanced. If the furnacemen said that they could not make iron within the specifications on account of the hundred and one reasons well known to you all, you would have the privilege of telling them to send you the best they could but at a price fixed by your specifications and depending upon the variation from the guarantee. This reduction in price should be proportioned in such a manner as to cover the cost of iron used in bringing the mixture up to specified analysis.

I do not claim that such a course would completely overcome the difficulty. There are dishonest people in the pig iron business, as well as in the foundry business If you have bought low and the furnaceman does not intend to ship you iron on a high market, there has yet to be found a means of forcing him to do so. There is, however, a course open to you when he does desire to fill your order on a falling market, viz., to refuse it on the ground that it was not delivered at specified time. This leads to a third clause which should be included in all specifications. If the pig iron is not delivered in the specified time, the buyer should have the privilege of canceling the order. This latter course is frequently taken advantage of regardless of agreement, but our pig iron friends have hard names and feelings for the ones who take this privilege. Included in the specifications, it would form a part of the contract and would be expected, and thus would form an incentive to the furnaceman to fill his contract on time.

Just why the furnaces have been given such leeway is a matter which puzzles many. A furnaceman may sell iron way beyond the capacity of his furnace and then expect sympathy when some firm whose orders he has failed to fill in guaranteed time, and who has had to purchase iron at a much higher price, declines to take the iron on a falling market. I think that we all appreciate the difficulties under which a furnaceman works; in fact, I think our pig iron friends have taught us to over-appreciate it, and that the furnaces take advantage of this fact many times. Modern blast furnace practice makes possible the production of a more uniform grade of iron than the old regime could accomplish. We have a right to expect and require more of the furnaces, but do we? A furnace running well within its capacity with the proper amount of fuel and the proper amount and kind of ore and flux, will produce a certain grade of iron. A furnace run beyond its capacity with the object of increasing its output may produce a fairly good grade of iron, but the furnaceman tells me that a furnace pushed in this way is much more apt to run "off." The founder is thus often expected to accept the explanation that the furnace is running "off" as some mysterious condition wholly beyond the control of the furnacemen, when in reality it is too often due to a desire to get more from the furnace than it will produce, or to the fact that the rise in price has made it possible to sell the increased output of the off product at a higher price than they would have obtained for their higher grades.

We are often told that iron bought under such strict specifications would be more expensive, and that the furnaceman would be forced to get a higher price for his iron. I am not so sure that this would be the case. When the market is normal and the supply and demand are somewhat equal, competition will accomplish all that specifications will. It is during the shortage such as we have recently experienced that our specifications would prove a restraint upon the furnacemen, and if appearances are correct, they should stand a little slicing of their profits and still remain solvent.

Let us admit, however, that there would be a slight increase in the cost of iron sold under specifications. Would it not be more than counterbalanced by the security that a buyer would feel in knowing that he would obtain the iron for which he had contracted or an equivalent decrease in price on another iron? The unhealthy, unnatural rise in price of iron, together with the inability of the furnace to fulfill contracts, has led to a heavy buying of foreign iron, and a consequent reduction in the price of the home product. Anything which tends to a steady, uniform price should be welcomed by both producer and consumer. It would be a great advantage to the founder to be able to make prices on castings, knowing that the pig iron would be delivered according to specifications. This would more than compensate for the slight increase in price which the furnace might be obliged to obtain for iron sold under such specifications.

These suggestions in regard to specifications are advanced in hopes of bringing about a discussion in which other and perhaps more important points might be brought out.

So much for the specification itself—let us consider for a moment its use. A concern makes out a set of specifications for its own use. The furnace sees in them requirements which it are not obliged to meet in order to get business, and the specifications are refused or a price quoted which makes the placing of the order impossible. This would be the result of any radical change in pig iron specifications advanced by one firm alone. In order to guarantee their success the specifications must come as a general demand from a large number of foundrymen. This Association, standing as it does as the representative of the foundries of this country, could make such a project a success.

In order successfully to introduce such specifications, the time must be opportune. Such a time is evidently at hand. I do not believe that the foundrymen of this country care to go through a third experience to teach them that something should be done to prevent a recurrence. Standard specifications with restrictive clauses, backed by the universal demand of foundrymen for their fulfillment, would be a long step in solving what has turned out to be a very difficult problem.

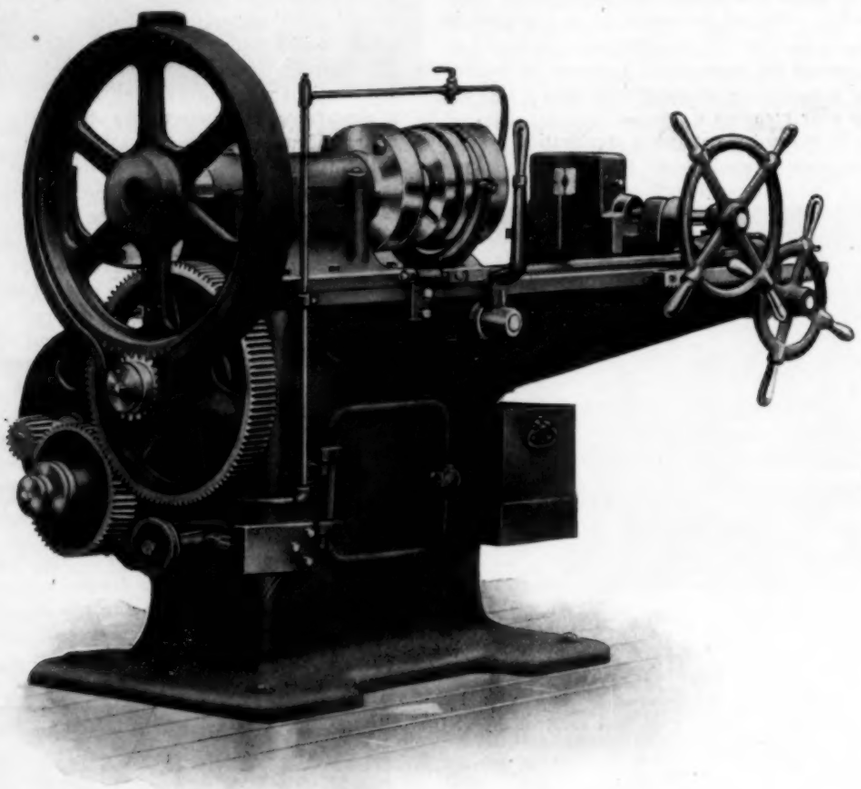
Eastern Steel Co. has been merged in the Eastern Steel Co., the only change in the corporate name being the prefix of the definite article. The recent sale to E. F. Hickey was for convenience in making the transfer. The capital of the new company is $5,700,000. The works are now in process of construction at Pottsville, Pa., and the company expects to produce about 120,000 tons of structural steel per annum. The new York office is at 45 Cedar St.

A MOTOR-DRIVEN BOLT CUTTER.

The illustration represents the standard type of motor-driven bolt cutter, manufactured by the Reliance Machine & Tool Co., of Cleveland. The particular machine shown is a 2-inch bolt cutter equipped with a Crocker-Wheeler reversible, variable speed, motor.

The speed variation is obtained by field control and is as 1 to 3 and the motor is connected by means of spur gearing directly to the machine. The motor being fastened to the back side of the machine is readily accessible and is at the same time kept free from grit and oil and occupies very little floor space. Gear covers are not shown in the half tone but are furnished with the complete machine. The company reports considerable demand for this class of tool which indicates the general and growing tendency towards electrically driven machinery.

The Alliance Machine Co., Alliance, O., which began operation June 21, 1901, has been very successful, and has now 210 men employed night and day, not including molders employed by another company making castings for the machine company. The company has shipped and placed in operation 76 cranes since September, 1902. It will ship 15 cranes and 2 drop hammers this month. The company has now negotiations under way, covering two different lines of manufacturing, and if the negotiations are carried through successfully, will build a duplicate machine building as well as a foundry of about the same dimensions. These improvements will not be made before next spring.



A MOTOR-DRIVEN BOLT CUTTER.

The annual reunion of the employes of A. C. Williams, manufacturer of sad irons and cast iron specialties, was held at Ravenna, O., June 18. The business was established at Chagrin Falls in 1844 by John W. Williams, father of the present proprietor, and the intimate associations of other years lead the former employes to go every year to Ravenna, the present home of the industry, for their celebration. Operations were begun in the new Ravenna plant ten years ago. The plant at Chagrin Falls was twice burned, in 1889 and 1892, and, after the second fire, it was decided to seek a new location. The business has been very prosperous and relations of employes and employer have been most cordial.

DECLINE OF THE SCOTCH WARRANT SYSTEM.

Repeated efforts have been made to graft the British pig iron warrant system upon the iron trade of the United States, but the iron masters of this country would have none of it. In view of the occasional agitation of the matter on this side, in publications calling attention to the alleged benefits of the warrant system, the following, indicating the decline of the system in its native environment, will be read with interest. It is taken from the London *Iron and Coal Trades Review:*

"The recent report of Messrs. Connal & Co., Ltd., on the stocks of pig iron in the warrant stores shows that these stocks have been reduced to such an extent that for the past three years the dividends on the preference shares of the storage company have had to be met largely out of the reserve fund. The directors, therefore, propose to sell some of the land which is no longer required, and to pay off the preference shares with the proceeds. As a matter of fact, the company has already erected tenements on some of its lands which are no longer required for the storage of iron. At the end of May the warrants in circulation represented only 15,000 tons. After the great boom between 1871 and 1874 there was a steady decline in the iron trade, and iron accumulated largely and rapidly. Between 1880 and 1890 the stocks were of the following proportions:

Stocks in Glasgow Iron Warrant Stores.

1st January.	Tons.
1880	745,000
1881	739,000
1882	940,000
1883	836,000
1884	835,000
1885	821,000
1886	1,050,000
1887	1,183,000
1888	1,228,000
1889	1,244,000
1890	1,035,000

"On December 31, 1888, the total was 1,228,833 tons more than on May 31 last. It is possible that the system may by-and-by entirely disappear. The American iron trade has always refused to countenance warrant stores for pig iron, and gets on very well without them."

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

Apex Equipment Co., 11 Broadway, New York, is in market for one 250-horsepower water-tube boiler for Kansas City delivery, one pulsometer pump with capacity of 1,000 gallons per minute, and 550 tons of 40-pound relayers for Georgia delivery.

Kirkpatrick & Johnson, engineers, Jackson, Miss., will receive proposals for steel tank 30,000 gallons, on tower 100 feet high to bottom of cylindrical portion of tank, erected at Pickens, Miss.

The Thorpe Mfg. Co., Columbus, O., has changed its name to the Columbus Sucker Rod Co., and increased its capital from $15,000 to $25,000.

The Loon Lake Iron Co., Sault Ste. Marie, Ont., has been incorporated by the Ontario government. Capital $3,000,000. The provisional directors are: Geo. Wagner, Marquette, Mich.; J. F. Carey, Escanaba, Mich.

The Western Machine Works, San Francisco, Cal., capital stock $20,000, has been incorporated.

The Flexible Shaft & Tool Co., Bellefontaine, O., capital $10,000, has been incorporated by Wm. G. Short, Riley A. Shafer, J. C. Hoover, John P. Arkin and Dow Arkin.

The Lincoln-Williams Twist Drill Co., Taunton, Mass., has been organized with a capital of $25,000. The officers are: Alfred L. Lincoln, president; James H. Ball, treasurer.

The Rolling Steel Shutter Works, New York, has been incorporated with a capital of $20,000. The directors are: Isaac D. Thomas, Philip Muck, and C. D. W. Rogers, New York.

Chisholm, Boyd & White Co., Chicago, has been incorporated with a capital of $250,000 to manufacture machinery.

The Claypool Electric Co., Columbus, O., has been incorporated to manufacture and deal in electrical machinery and appliances. Capital $15,000.

The Metropolis Bending Co., Metroplis, Ill., has been incorporated with a capital of $100,000 for manufacturing and selling carriage work.

The City Foundry Co., Lorain, O., has been incorporated with a capital of $5,000 by John J. Schwartz, George J. Bath, John F. Hyre, Andrew Robinson and Sherman D. Falconer.

The Denver Steel Casting Co., Denver, Colo., has been incorporated with a capital of $500,000.

The Dean Mfg. Co., Seymour, Wis., has been incorporated with a capital of $20,000, to manufacture engines and boilers.

The Montana Fuel & Iron Co., Butte, Mont., has been incorporated with a capital of $100,000. The directors are: F. D. Lingenfelter, Dr. F. H. Bunrose, and H. L. Frank, all of Butte.

The Downie-Wright Mfg. Co. has been organized at York, Neb., to operate a foundry and machine shop. The authorized capital stock is $75,000.

Fires and Accidents:—

Fire in the shops of the Tioga Foundry Co., Philadelphia, June 18, caused a loss of $1,000 on the buildings and a further loss on contents.

New Construction:—

Work has been started on the erection of the new buildings and machine shops of the Union Forge Co., Pittsburg, Pa. The main building will have a frontage of 50 feet, and will extend back 128 feet. The company was organized about a month ago with a capital of $50,000, and is owned by the officials of the McClintic-Marshall Construction Co. The product will be rivets, bolts and forgings. The plant is not expected to be in operation before October 1st.

A foundry will be erected by the Crucible Steel Casting Co. in Milwaukee. The building will be of brick, concrete frame, and will measure 70x173 feet.

Ground has been broken for the improvements to be made to the plant of the Illinois Steel Co., Chicago. The improvements will cost $2,000,000.

The new blast furnace of the South Chicago Furnace Co. is nearing completion and will go into blast in July.

The Canadian Iron & Foundry Co., Toronto, has purchased a site in the eastern part of that city, and intends to erect a foundry for heavy castings. The making of car wheels and small castings will be continued in the present buildings.

A. Murphy is erecting a machine shop 50x100 feet at Genesee, Idaho.

The Western Foundry Co., Covington, Ky., has purchased land across the street from its present plant, and will build additions which will largely increase the capacity of the plant.

The Houston, Stanwood & Gamble Co., Covington, Ky., has leased an entire block of ground and expects to build thereon a plant for engine building.

The Cresson Foundry & Machine Co., Johnstown, Pa., which recently increased its capital from $5,000 to $100,000, will erect two large buildings for the manufacture of mine cars. The following officers have been elected: John W. Kephart, of Ebensburg, president; P. B. Cosgrove, of Hastings, vice president; R. E. Leahey, secretary and treasurer. The board of directors consists of the Messrs. Kephart and Cosgrove, Shoff and Weneroth, of Cresson, and Smith, of Ebensburg.

The New England Enameling Co., Middletown, Conn., contemplates making extensive additions to its plant. Cost of improvements is estimated at about $75,000; which will be made provided the board of trade at Middletown gives the assistance asked by the stockholders of the company.

A 300-foot addition will be built to the main building of the Standard Steel Car Works, at Butler, Pa., making the building nearly 2,000 feet long. During the present month 76 cars have been turned out at the plant each day.

The Bucyrus Steam Shovel & Dredge Machine Co., South Milwaukee, Wis., has just completed a new erecting shop, and is planning to extend its works more. The Stowell Mfg. Co., and the Eagle Horseshoe Co., both of South Milwaukee, are also extending and improving their plants.

The American Frog & Mfg. Co., Kansas City, Mo., lately reported as incorporated with capital of $250,000, has purchased the plant of the Cookson Mfg. Co. and Kansas City Switch & Frog Works, and will operate same, erecting complete switch and frog plants, foundry and machine shops. It is reported that no contracts for additional machinery have been awarded. Address, 302 New England Building, Kansas City.

The Prouty Locomotive Co., Lansing, Mich., will build a plant in which it will manufacture gas locomotives.

The Chicago, Milwaukee & St. Paul Railroad has just completed its new powerhouse, which is said to be the most complete structure of its kind in the northeast. The plant is divided into two sections, one containing four Babcock and Wilcox boilers and the other occupied by an air compressor, two direct-connected generators and Nordberg steam engines. In the north section of the structure are four pumps and condensers. Adjacent to it has been built a storage water tower for condensed steam, capacity 200,000 gallons, built of steel, 70 feet high, which is to furnish warm water to locomotive boilers. The plant is at Milwaukee.

J G. Holmstrom has purchased a site at Morris, Minn., and will erect a two-story building 26x60 feet, to be used as a machine shop.

The Carnegie Steel Co. is erecting a new office building at Duquesne, Pa. The structure will be of red pressed brick, three stories, and will cost about $30,000.

The Crown Iron Works Co., Minneapolis, Minn., is erecting a foundry at a cost of $7,000.

The United Engineering & Foundry Co., Pittsburg, has been granted a permit to erect a steel and brick machine shop at 54th St. and Allegheny Valley Railroad, at a cost of $42,000.

R. L. Sibley & Co., Albemarle, N. C., whose machine shop was destroyed by fire on June 3, are rebuilding and expect to have their plant running in a month. The new plant will be about three times the size of the old one.

The Columbus Screw & Machine Co., Columbus, O., a corporation organized by machinists, has purchased a lot and will begin at once the erection of the building.

The Pressed Steel Car Co. will build a one-story addition to its plant on Cass Ave., Allegheny, at a cost of $25,000.

General Industrial Notes:—

At the annual meeting of the stockholders of The Burden Iron Co., Troy, N. Y., June 17, the following were re-elected directors: James A. Burden, Sr., I. Townsend Burden, John L. Arts, James A. Burden, Jr., Williams P. Burden and Arthur

S. Burden. The directors elected the following: President, James A. Burden, Sr.; vice president, James A. Burden, Jr.; general manager, John L. Arts; secretary, Nicholas J. Gable.

The Peden Iron & Steel Co., wholesale dealer in machinery and supplies at Houston, Tex., has purchased the Howard F. Smith Machinery Co.'s stock and good will and the former company's intention is to carry a larger and better assorted stock of mill supplies than ever before. The company is now ready for business in its new quarters, 110 and 112 Travis St. It is not the intention to purchase any machinery for its own use, but it is already a large handler of engines and boilers, drilling outfits and oil well supplies.

The Brooks Tire Machine Co., recently incorporated at Wichita, Kas., does not at present expect to build, but very likely will put an addition to its present shops this coming fall and may find it necessary to put in some more machinery prior to that time, such as a shaper, milling machine and furnace for case-hardening steel.

The Enterprise Gas Stove Mfg. Co., Nos. 9 to 13 Desbrosses St., New York, has made an assignment to Edward F. Curley. The business was started in 1892. An assignment was made in 1902, with liabilities $52,000 and actual assets $16,427.

The Inter-State Drainage & Investment Co. has purchased the foundry and machine shop of the Garfield-Richardson Co., of Algona, Ia. The intention is to move the plant to Britt, Ia., giving the purchasing company facilities for repairing its ditching and other machinery instead of having to send it to Chicago and other cities. In addition the shops will be used for jobbing and general repair work.

The Puget Sound Iron & Steel Works, Tacoma, Wash., have absorbed the Ollard Iron Works, on the water front, of that city.

L. C. Smith Brothers & Co., Syracuse, N. Y., within a few days will begin making tools for their new visible typewriter, and it is expected that the new machine will be on the market January 1.

The first steel ever manufactured in Mexico was turned out June 16 by the new steel plant at Monterey. It will manufacture steel rails and structural steel.

E. C. Byers, of Cincinnati, is making arrangements for building a plant in Chattanooga, Tenn., for the manufacture of wire buckles. According to the present plans a building 100x50 feet will be erected.

Sheets are now being rolled at the plant of the Columbia Steel Co., Elyria, O. Manager Marwick says that in a short time the plant will be turning out 500 tons of steel a month.

Contract has been awarded to the Lloyd-Booth mills of the United Engineering & Foundry Co. for additional pipe bending machines, which are to be installed in the plant at Middletown, Pa.

Work was started a few days ago at the new Duplex Foundry at Elyria, O. The first casting was made by Mayor Folger, who learned the molder's trade forty years ago. The chief product of the plant will be catch basins.

The Bessemer steel plant of the Republic Iron & Steel Co., at Youngstown, O., will be closed down June 27, and will remain idle for two months, during which time a new blooming mill, converters and a new engine will be installed. The blooming mill is to be furnished by the Lloyd Booth plant of Youngstown. The converters and stands come from the shops of the Pennsylvania Engineering Co., of New Castle, Pa. The engine is the product of the shops of the William Tod Co., of Youngstown.

The Michigan Consolidated Boat Co., Battle Creek, Mich., has purchased the building of the Reed Implement Co. and will move into it at once. The boat company has been manufacturing steel and canvas boats in an old knitting mill and tents, being unable to secure better facilities.

The El Paso Foundry & Machine Co., El Paso, Texas, will sell its present site and move to a new location where it will build on a larger scale.

The drillers who have been boring holes in the site of the new tube mills at McKeesport, Pa., have completed the task of drilling over 2,500 holes, and find that to secure a solid rock foundation, the National Tube Co. will have to make a very large expenditure. At no point on the entire site of over 50 acres was a solid rock bottom found at a depth of less than 35 feet. Over almost all the site were found immense quantities of quicksand. To obtain a solid foundation the company will have to make excavations of from 30 to 40 feet, and then drive piles down into the earth 15 to 20 feet. Over 200 houses located on the site of the mills have been torn down within three weeks, and the land is rapidly being cleared to make way for the new construction.

The stockholders of the Toledo Co-operative Foundry Co. have elected the following officers: President, B. A. White; vice president, Edward Caulkins; treasurer, Cyrill Freckette; secretary, F. E. Reynolds. The officers of the company are now seeking a location for their plant, and have several places under consideration.

The rolling mills of the Republic Iron & Steel Co. and the Emlyn Iron Works at East Chicago have resumed after a long period of inactivity.

The D. M. Tuttle Co., of Canastota, N. Y., which manufactures gasoline engines and pleasure boats, is to remove its plant from Canastota to Baldwinsville, N. Y. The concern is to be reorganized with a capital of $60,000.

The new furnaces of the Reading Iron Co., at Reading, Pa., are now in operation. The work on the new pipe mill is progressing rapidly. The engines are now being placed in position.

The Bowie Stove Co., Rome, Ga., recently incorporated, is now running with about two-thirds of the force which it expects to employ and is turning out about 30 stoves per day.

Orlando Hamilton has sold his interest in the Pease Engine & Machine Works, Goshen, Ind., to Christian Soens, of South Bend, Ind. It is understood that additions will be made to the plant.

The opening of the Ohio River as far as Merill, as it is expected will be done this fall, will be followed by the building of several steamers for local trade between Pittsburg and Beaver, Pa. The American Steel & Wire Co. is interested in the raising of the bridges along the Allegheny, and intends, as soon as it is possible to get its boats through under the bridges, to establish a through line of barges between its furnaces on Neville Island and its mills.

The Interlocking Fence Co., of Morton, Ill., is seeking larger quarters and better railroad facilities and contemplates moving to Peoria, Ill.

The malleable and gray iron plant of Arthur E. Barlow, successor to Morris & Barlow, Newark, N. J., is interesting in that the establishment was the seat of the earliest production of malleable cast iron in the United States. The original concern was established in 1826. A number of improvements have been made in the past two years.

The Dominion Iron & Steel Co. is producing 615 tons of pig iron daily from three furnaces and 700 tons of steel billets. The fourth blast furnace is idle because of insufficient coke supply, but 50 additional coke ovens have been completed lately. An issue of $1,500,000 additional capital has been decided upon to complete mills now under construction. The April net earnings of the company were reported at $36,000, or slightly more than the monthly interest charge on $8,000,000 of bonds. The interest on $4,500,000 floating debt is about $24,000 a month.

The Colorado Fuel & Iron Co. has just completed negotiations whereby it comes into possession of a valuable water right of the Roaring Fork River at the southeastern boundary of Pitkin County, Colorado. Within a short time the work of driving a tunnel distance of from 300 to 500 feet through the mountain will be begun.

The Springfield Mechanical Boiler Cleaner Co., Springfield, O., recently incorporated, is manufacturing the "Roberts cleaner" for horizontal tubular boilers. The cleaners have already been tested by the O. S. Kelly Co., of Springfield, and by other concerns, and the result was said to be very satisfactory.

The Trenton Iron Co., of Trenton, N. J., has secured a contract through Van Voorhis & Sanford, of Monterey, for a wire rope tramway to be installed in the San Juan Mines, located in the vicinity of Monterey, Mexico.

The American Steel Casket Co., Boston, has purchased the business and plant of the American Metal Casket Co., and now occupies the three-story brick and frame buildings of the latter at East Pepperell, Mass. The authorized capital is $500,000, of which $250,000 remains in the treasury. The company is increasing its working capital by the sale of $100,000 of the treasury stock at par for cash. It will do no building at present.